Panoche Energy Center
Application for Certification
Data Requests Responses
06-AFC-5

Data Response Guide

Data Request	Page
Air Quality	
AQ-1	AQ-1
AQ-2	AQ-2
AQ-3	AQ-26
AQ-4	AQ-57
AQ-5	AQ-60
AQ-6	AQ-61
AQ-7	AQ-62
AQ-8	AQ-63
AQ-9	AQ-64
AQ-10	AQ-65
AQ-11	AQ-67
AQ-12	AQ-68
AQ-13	AQ-94
AQ-14	AQ-95
AQ-15	AQ-96
AQ-16	AQ-97
AQ-17	AQ-98
AQ-18	AQ-99
AQ-19	AQ-100
AQ-20	AQ-101
AQ-21	AQ-102
AQ-22	AQ-103
AQ-23	AQ-107
AQ-24	AQ-108
AQ-25	AQ-109
AQ-26	AQ-114
Biological Resources	
BIO-27	BIO-1
Cultural Resources	
CR-28	CulRes-1
CR-29	CulRes -2
CR-30	CulRes -3
CR-31	CulRes -4
CR-32	CulRes -7
CR-33	CulRes -8
Geological Resources	
GEO-34	GEO-1
GEO-35	GEO-2
GEO-36	GEO-3

GEO-37	GEO-4
GEO-38	GEO-5
Land Use	
LAND-39	LAND-1
LAND-40	LAND-2
Noise	
NOI-41	NOI-1
Socioeconomics	
SOCIO-42	SOCIO-1
SOCIO-43	SOCIO-2
SOCIO-44	SOCIO-3
Soils	
SOIL-45	SOIL-1
SOIL-46	SOIL-2
SOIL-47	SOIL-7
SOIL-48	SOIL-8
SOIL-49	SOIL-9
SOIL-50	SOIL-13
Transmission System Eng.	
TSE-51	TSE-1
Visual Resources	
VISRES-52	VISRES-1
VISRES-53	VISRES-3
VISRES-54	VISRES-4
VISRES-55	VISRES-5
VISRES-56	VISRES-6
VISRES-57	VISRES-7
VISRES-58	VISRES-8
VISRES-59	VISRES-9
Waste Management	
WASTE-60	WM-1

TECHNICAL AREA: AIR QUALITY

Data Request 1 Rev: Please provide copies of all substantive District correspondence regarding the PEC permit application, including e-mails, within one week of submittal or receipt. This request is in affect until the final Commission Decision has been recorded.

Response:

Effective this date of PEC's response to the CEC Data Request dated December 8, 2006, PEC plans to provide the CEC with copies of all substantive correspondence between PEC and the SJVAPCD (Air District or District) within one-week of submittal or receipt.

TECHNICAL AREA: AIR QUALITY

Data Request 2 Rev: Please provide revised project emission tables that incorporate all proposed changes to the gas turbine and emergency engine emissions. The tables with revised emission values would likely include: Table 5.2-12, Table 5.2-13, Table 5.2-14, Table 5.2-15, Table 5.2-21, Table 5.2-24, and the tables provided in Appendix I, Attachment C.

Response:

Revised Tables 5.2-12, 5.2-13, 5.2-14, 5.2-15, 5.2-21 and 5.2-24 are provided below. The most significant change in these emission data compared with those in the AFC result from an improvement in the manufacturer's guaranteed PM10 emission rate for the LMS100 CTGs from 11 lb/hr/turbine to 6 lb/hr/turbine. Other much smaller changes have resulted from small revisions to the turbine commissioning and startup emissions, as described in the responses to several other data requests. Sulfur dioxide emissions from the turbines continue to be calculated in these tables based on a very conservative assumed natural gas fuel sulfur content of 0.75 grains per 100 dry standard cubic feet, since this is the sulfur level required to be assumed per the policy of the San Joaquin Valley Air Pollution Control District. However, per agreement with SJVAPCD, emissions offset requirements for this pollutant will be determined based on an annual average sulfur content of 0.32 grains per 100 dry standard cubic feet.

Revised operational emission spreadsheets replacing those originally presented in Appendix I, Attachment C are also provided immediately following the above mentioned revised tables.

TABLE 5.2-12 (REVISED)
1-HOUR OPERATING EMISSION RATES FOR CTG OPERATING LOAD SCENARIOS

Load	Exhaust Flow (acfm)	Exit Velocity (ft/s)	Exit Temp (°F)	NO_X Normal (lb/hr)	NO_X Uncontrolled (lbs/hr)	CO Normal (lbs/hr)	CO Uncontrolled (lbs/hr)	SO_2 Normal (lbs/hr)	SO_2 Uncontrolled (lbs/hr)	VOC Normal (lbs/hr)	VOC Uncontrolled (lbs/hr)	PM_{10} Normal (lbs/hr)	PM_{10} Uncontrolled (lbs/hr)
100%													
114°F Off	816,088	95.0	817	7.20	80.6	10.46	183.1	1.7	1.7	2.0	3.0	6.0	6.0
114°F On	854,672	99.5	801	7.63	85.4	11.23	196.6	1.8	1.8	2.67	3.2	6.0	6.0
63°F	888,554	103.5	787	8.03	89.9	11.81	206.6	1.9	1.9	2.2	3.3	6.0	6.0
17°F	873,723	101.7	741	7.79	87.2	11.45	200.4	1.85	1.85	2.43	5.1	6.0	6.0
75%													
114°F	721,939	84.1	800	6.12	68.5	8.86	155.1	1.48	1.48	1.80	2.7	6.0	6.0
63°F	746,033	86.9	766	6.32	70.8	9.22	161.4	1.54	1.54	1.93	2.9	6.0	6.0
17°F	737,502	85.9	746	6.19	69.3	9.02	157.9	1.52	1.52	2.05	4.3	6.0	6.0
50%													
114°F	578,809	67.4	804	4.49	50.3	6.47	113.3	1.12	1.12	1.1	1.1	6.0	6.0
63°F	598,001	69.6	783	4.57	51.2	6.81	119.1	1.15	1.15	0.92	1.1	6.0	6.0
17°F	591,948	68.9	765	4.61	51.6	6.63	116.1	1.17	1.17	1.53	2.3	6.0	6.0

Note: Maintenance rates are uncontrolled emission rates.

ºF	=	degrees Fahrenheit
%	=	percent
acfm	=	actual cubic feet per minute
CO	=	carbon monoxide
CTG	=	combustion turbine generator
lbs/hr	=	pounds per hour
ft/s	=	feet per second
NO_X	=	nitrogen oxide(s)
Ops	=	operations
PM_{10}	=	particulate matter less than 10 micrometers in diameter
VOC	=	volatile organic compounds
SO_2	=	sulfur dioxide

TABLE 5.2-13 (REVISED)
CRITERIA POLLUTANT EMISSIONS FOR EACH CTG DURING STARTUP AND SHUTDOWN

	Startup/Warmup 10 minutes/20 minutes		Shutdown 10.5 minutes
Pollutant	Startup Total lbs per Event	Warmup Total lbs per Event	Total lbs per Event
NO_X	5.0	17.3	6.0
CO	14.0	39.3	47.0
VOC	3.0	0.8	3.0
SO_2	0.32	0.63	0.33
PM_{10}	1.0	2.0	1.05

Notes:
CO = carbon monoxide
CTG = combustion turbine generator
lbs = pounds
NO_X = nitrogen oxide(s)
PM_{10} = particulate matter less than 10 micrometers in diameter
VOC = volatile organic compounds
SO_2 = sulfur dioxide

TABLE 5.2-14 (REVISED)
CRITERIA POLLUTANT SOURCES AND EMISSION TOTALS FOR THE WORST-CASE PLANT-WIDE EMISSIONS SCENARIOS CORRESPONDING TO ALL AVERAGING TIMES

Averaging Time	Operating Equipment	Pollutant	Sources		
			Turbines 1-4	Diesel Fire Pump	Cooling Tower
			Emissions in lbs – Entire Period		
1-hour	Four turbines operating at highest commissioning rate, except for SO_2 which uses normal operating load for all.	NO_X	672.24	1.38	-
		CO	1,222.52	0.23	-
		SO_2	7.6	0.002	-
3-hour	All turbines operating at normal operating loads.	SO_2	22.8	0.002	-
8-hour	Four turbines operating 8 hours at highest commissioning rates.	CO	9,780.16	0.23	-
24-hour	For PM_{10}, turbines operate with 3 startups, 3 shutdowns, and remaining time at normal operating load, plus cooling tower and 1 hour of fire pump. For SO_2, turbines operate at normal operating load.	PM_{10}	576.0	0.05	8.4
		SO_2	182.4	0.002	-
Annual	Turbines operate for 5,000 total hours which include 365 startups, 365 shutdowns, and 4,754 hour at normal operating loads. Cooling Tower operates 5,000 hours and fire pump operates 52 hours (1 hour per week).	NO_X	193,943.2	71.54	-
		PM_{10}	120,000.0	2.75	1,750.0
		SO_2	36,718.0	0.12	-

Notes:
CO = carbon monoxide
lbs = pounds
NO_X = nitrogen oxide(s)
PM_{10} = particulate matter less than 10 micrometers in diameter
SO_2 = sulfur dioxide

TABLE 5.2-15 (REVISED)
ESTIMATED ANNUAL PEC OPERATIONAL EMISSIONS OF CRITERIA POLLUTANTS

Pollutant	Emissions (tons/year)[1,2]
SO_2[3]	18.36
NO_X	97.01
VOC	30.33
PM_{10}[4]	60.88
CO	185.46
Lead	Negligible[5]

Notes:

1 Includes emissions from four turbines, cooling tower, and 52 hours per year testing of the emergency diesel fire pump driver.

2 Turbine missions based on 365 startups and shutdowns, and 4,754 hours of normal full-load operations for each turbine.

3 SO_2 emissions shown in this table are calculated based on a worst-case natural gas fuel sulfur content of 0.75 grains per 100 standard cubic feet.

4 PM_{10} emissions include both filterable (front-half) and condensable (back-half) particulates.

5 Lead emissions are 'non-detect' from AP-42 for natural gas-fired combustion turbines and the diesel fire pump will operate no more than 24 hours per year.

CO = carbon monoxide
NO_X = nitrogen oxide(s)
PM_{10} = particulate matter less than 10 micrometers in diameter
VOC = volatile organic compounds
SO_2 = sulfur dioxide

TABLE 5.2-21 (REVISED)
ESTIMATED EMISSIONS OFFSETS REQUIREMENTS

Calendar Quarter	Project Emissions (tons)	ERCs Required (tons)[1,2]
NO_x		
First	21.34	27.742 – 32.01
Second	21.34	27.742 – 32.01
Third	31.04	40.352 – 46.56
Fourth	23.28	30.264 – 34.92
Max. Annual Total		**145.50 tons**
VOC		
First	6.67	8.671 – 10.005
Second	6.67	8.671 – 10.005
Third	9.71	12.623 – 14.565
Fourth	7.28	9.464 – 10.920
Max. Annual Total		**45.495 tons**
PM_{10}		
First	13.39	17.407 – 20.085
Second	13.39	17.407 – 20.085
Third	19.48	25.324 – 29.22
Fourth	14.61	18.993 – 21.915
Max. Annual Total		**91.305 tons**
SO_x[3]		
First	1.78	1.78
Second	1.78	1.78
Third	2.59	2.59
Fourth	1.95	1.95
Max. Annual Total		**8.10 tons**

Notes:

1 Quantity of ERCs required depends on distance factor applicable to individual emission reduction sources. Values shown here correspond to a range of distance factors from 1.3/1 to 1.5/1

2 No distance factor applied in calculating SO_2 ERC requirements, because annual emissions for this pollutant will be below the SJVAPCD offset triggering threshold of 27.375 tons

3 For purposes of offset calculations, SO2 emissions are calculated based on a natural gas fuel

ERCs = emission reduction credits
NO_x = nitrogen oxide(s)
PM_{10} = particulate matter less than 10 microns in diameter
SO_x = sulfur oxides
VOC = volatile organic compounds

TABLE 5.2-24 (REVISED)
PSD EMISSION THRESHOLD TRIGGERS
FOR NEW STATIONARY SOURCES

Pollutant	Significant Thresholds (tpy)	Project Emissions (tpy)	PSD Triggered by Project?
SO_2	250	8.01	No
NO_X	250	97.01	No
VOC	250	30.33	No
PM_{10}	250	60.88	No
CO	250	185.46	No

Project emissions include all emissions from natural gas turbines, cooling tower, and emergency diesel fire pump driver.

Notes:
CO = carbon monoxide
NO_X = nitrogen oxide(s)
Pb = lead
PM_{10} = particulate matter less than 10 micrometers in diameter
PSD = prevention of significant deterioration
SO_2 = sulfur dioxide
tpy = tons per year
VOC = volatile organic compounds

APPENDIX I

AIR QUALITY DATA

ATTACHMENT C

SUPPORTING INFORMATION ON ESTIMATION OF PROJECT OPERATION EMISSIONS

PEC Turbines 100%

Case	100	101	104	107
Ambient Temperature (°F)	114	114	63.3	16.8
Stack Diameter (ft)	13.5	13.5	13.5	13.5
Exhaust Flow (lb/hr)	1496922	1584697	1669071	1710622
CTG Load Level	100%	100%	100%	100%
Evap. Cooler	OFF	ON	OFF	OFF

Data from Vendor Area = 143.14 ft^2

Expected Operation of Each Gas Turbine - Normal Operation

(Reference: Emission Summary GE LMS100 PA Turbine/Site Specific (372 elev) Information)

Heat Consumed (MMBTU/hr)	813.8	862.5	909.7	885.2
Turbine Outlet Temperature (°F)	817	801	787	741
Exhaust Flow (acfm)	816088	854672	888554	873723
Stack Exit Velocity, ft/m	5701.4	5970.9	6207.6	6104.0
Stack Exit Velocity, m/s	28.96	30.33	31.53	31.01
Nitrogen, % Vol	71.82	71.54	71.84	72.68
Oxygen, % Vol	11.51	11.43	11.49	12.08
Carbon Dioxide, % Vol	3.95	3.95	3.96	3.78
Argon, % Vol	0.86	0.86	0.86	0.87
Water Vapor, % Vol	11.85	12.20	11.83	10.57
Molecular Weight	28.01	27.97	28.01	28.13

Data from Vendor

Average Emission Rates from Each Gas Turbine (lbs/hr) - Normal Operations

NO_X at 28 ppmvd pre-BACT level	80.60	85.40	89.90	87.20
NO_X at 2.5 ppmvd BACT level	7.20	7.63	8.03	7.79
CO at 105 ppmvd pre BACT level	183.10	196.60	206.60	200.40
CO at 6.0 ppmvd BACT level	10.46	11.23	11.81	11.45
UHC at 4-7 ppmvd pre-BACT leve	4.50	4.80	6.70	8.60
VOC at 2.4-4.2 ppmvd BACT leve	3.00	3.20	3.30	5.10
VOC at 2.0 ppmvd BACT level	2.00	2.67	2.20	2.43
SO_2 short-term rate	1.70	1.80	1.90	1.85
SO_2 annual rate	1.70	1.80	1.90	1.85
PM_{10}	6.00	6.00	6.00	6.00
NH_3 at 10 ppmvd tBACT level	10.70	11.30	11.90	11.50
Sulfur content in fuel basis for abov	0.75	grains total S/100 scf		short-term
Sulfur content in fuel basis for abov	0.75	grains total S/100 scf		long-term

Data from Vendor

Startup / Shutdown Emissions from Turbine

Startup

duration in minutes	10	20	30	30	Average	1 hour of
	Startup	SCR Warmup	Total Startup	Normal	Startup	Startup
	Emissions	Emissions	Emissions	Emissions	Emissions	Emissions
	lb/event	**lb/event**	**lb/event**	lb/hour	lb/hour	lb/hour
NO_X	5.00	17.30	22.30	8.03	26.31	44.6
CO	14.00	39.30	53.30	11.81	59.20	106.6
VOC	3.00	0.80	3.80	2.67	5.13	7.6
SO_2	0.32	0.63	0.95	1.90	1.90	1.9
PM_{10}	1.00	2.00	3.00	6.00	6.00	6

Assumptions:

Startup Emissions for CO, NO_2, PM_{10}, and VOC integrated from data provided by GE and Bibb.

SO_2 emissions assume complete conversion of all sulfur to SO_2.

Normal emissions are highest of four operating cases listed above (case 104), except for VOC.

Shutdown

duration in minutes	10.5	49.5		1 hour of
	Shutdown	Normal	Total Shutdown	Shutdown
	Emissions	Emissions	Emissions	Emissions
	lb/event	lb/hour	lb/hr	lb/hour
NO_X	6.00	8.03	12.62	34.3
CO	47.00	11.81	56.74	268.6
VOC	3.00	2.67	5.20	17.1
SO_2	0.33	1.90	1.90	1.9
PM_{10}	1.05	6.00	6.00	6.0

Assumptions:

Shutdown Emissions for CO, NO_2, PM_{10}, and VOC integrated from data provided by GE and Bibb.

SO_2 emissions assume complete conversion of all sulfur to SO_2.

Normal emissions are highest of four operating cases listed above (case 104) except for VOC.

Commissioning Emissions

		Total Pounds Emitted				
	Hours	NO_x	CO	VOC	PM_{10}	SO_2
First Fire	16	178.00	727.00	18.50	96.00	30.4
Synch & Check E Stop	12	133.50	545.20	13.90	72.00	22.8
Additional AVR Testing	12	251.00	363.20	8.70	72.00	22.8
Break-In Run	8	167.30	242.10	5.80	48.00	15.2
Dynamic AVR	40	1959.40	3012.00	191.90	240.00	76
Base Load AVR	16	2689.00	4890.00	239.00	96.00	30.4
Total Commissioning Hours	104					
		Maximum Emission Rates lb/hr				
		NO_x	CO	VOC	PM_{10}	SO_2
First Fire	16	11.13	45.44	1.16	6.00	1.90
Synch & Check E Stop	12	11.13	45.43	1.16	6.00	1.90
Additional AVR Testing	12	20.92	30.27	0.73	6.00	1.90
Break-In Run	8	20.91	30.26	0.73	6.00	1.90
Dynamic AVR	40	48.99	75.30	4.80	6.00	1.90
Base Load AVR	16	168.06	305.63	14.94	6.00	1.90

Worst-Case 1-Hour Emissions per Turbine

Worst-Case 1-Hour Emissions are equal to the commissioning emission rates, except for SO_2 which has worst-case emissions during normal operations and PM_{10} which has worst-case emissions during startup.

Emissions per turbine	**lb/hr**						**g/s**
NO_2	168.06						21.18
CO	305.63						38.51
VOC	14.94						1.88
SO_2	1.90						0.24
PM_{10}	6.00						0.76

Worst-Case 3 Hour Emission Rate per Turbine

Only SO_2 is considered for an average 3-hour Ambient Air Quality Standard.
Worst-case 3-Hour Scenario are equal to 3 hours at normal rate.

Emissions per turbine	**Worst-case Total**	**Startup /Warmup**	**Shutdown**	**Normal Operations**	**Worst-case Total**	**Startup /Warmup**	**Shutdown**	**Normal Operations**	**Worst-case Total**
	lb/hr				**Total lbs**				**g/s**
Total Hours of Operation	3.0			3.0				3.0	
SO_2	1.90			1.90	5.71			5.71	0.24

Worst-Case 8-Hour Emission Rates

Only CO is considered for an average 8-hour Ambient Air Quality Standard.

Worst-case 8-Hour Scenario includes 8 hours of commissioning. Only one turbine will be undergoing commissioning at any one time.

Emissions per turbine	Worst-case Total	Startup /Warmup	Shutdown	Commis-sioning	Normal Operations	Worst-case Total	Startup /Warmup	Shutdown	Commis-sioning	Normal Operations	Worst-case Total
	lb/hr					Total lbs					g/s
Total Hours of Operation	8			8	0				8	0.00	
CO	305.63			305.63	0.00	2445.00			2445.00	0.00	38.51

Worst-Case 24 Hour Emission Rate

Only SO_2 and PM_{10} are considered for an average 24-hour Ambient Air Quality Standard.

Worst-case 24-Hour Scenario for PM_{10} includes 3 Startups, 3 Shutdowns, and remaining time at normal rate.

Worst-case 24-hour scenario for SO_2 uses normal operations.

Emissions per turbine	Worst-case Total	Startup /Warmup	Shutdown	Normal Operations	Worst-case Total	Startup /Warmup	Shutdown	Normal Operations	Worst-case Total
	lb/hr				Total lbs				g/s
Total Hours of Operation	24	1.50	0.525	21.975		1.50	0.525	21.975	
NO_X	10.89	44.60	34.29	8.03	261.29	66.90	18.00	176.39	1.37
CO	23.35	106.60	268.57	11.81	560.33	159.90	141.00	259.43	2.94
VOC	3.29	7.60	17.14	2.67	79.00	11.40	9.00	58.60	0.41
SO_2	1.90			1.90	41.83	0.00	0.00	41.83	0.24
PM_{10}	6.00	6.00	6.00	6.00	144.00	9.00	3.15	131.85	0.76

SO_2 Commissioning		**PM_{10} Commissioning**	
First Fire	1.90	First Fire	6.00
Synch & Check E Stop	1.90	Synch & Che	6.00
Additional AVR Testing	1.90	Additional AV	6.00
Break-In Run	1.90	Break-In Run	6.00
Dynamic AVR	1.90	Dynamic AVF	6.00
Base Load AVR	1.90	Base Load A	6.00

CTG Commissioning testing could operate for 24 hours.

Commissioning

	First Fire	Synch & Check E Sto	Additional AVR Testing	Break-In Run	Dynamic AVR	Base Load AVR
			Emissions	Emissions	Emissions	Emissions
	Total lbs					
	16	12	12	8	40	16
NO_X	178.00	133.5	251	167.3	1959.4	2689
CO	727.00	545.2	363.2	242.1	3012	4890
VOC	18.50	13.9	8.7	5.8	191.9	239
SO_2						
PM_{10}	96.00	72	72	48	240	96

Average Annual Emissions

Average Operation lb/hr Emission Rates presented below for normal operations are based on the 63°F, 100% load operation scenario for 5,000 total operating hours, which includes 365 startup/warmup events, 365 shutdown events, and 20 maintenance hours.
Worst-case total emission rate incorporates estimated operating hours at different temperatures.

Emissions per turbine	Worst-case Total	Startup /Warmup	Shutdown	Normal Operations	Worst-case Total	Startup /Warmup	Shutdown	Normal Operations	Worst-case Total
	lb/hr				Total lbs				g/s
Total Hours of Operation	5000	182.50	63.88	4753.6250					
Number per Scenario		365	365						
Duration of Event (min)		30	10.5	60					
NO_X	5.53	44.60	34.29	8.03	48485.8	8139.5	2190.0	38156.3	0.70
CO	10.59	106.60	268.57	11.81	92729.4	19454.5	17155.0	56119.9	1.33
VOC	1.73	7.60	17.14	2.67	15158.3	1387.0	1095.0	12676.3	0.22
SO_2	1.09	1.90	1.89	1.90367	9516.5	346.8	120.5	9049.3	0.14
PM_{10}	3.42	6.00	6.00	6.00	30000.0	1095.0	383.3	28521.8	0.43

Note: Worst-case lb/hr is the total emissions (lbs) over 8760 hours/year

timated annual normal operating hou 4754

ANNUAL TOTALS	1 unit	4 units		turbines + fire pump		cooling tower + turbines + fire pump	
NO_X	24.24	96.97	tpy	97.01	tpy	97.01	tpy
CO	46.36	185.46	tpy	185.46	tpy	185.46	tpy
VOC	7.58	30.32	tpy	30.33	tpy	30.33	tpy
SO_2	4.76	19.03	tpy	19.03	tpy	19.03	tpy
PM_{10}	15.00	60.00	tpy	60.00	tpy	60.88	tpy

PEC Turbines 75%

Case	102	105	108
Ambient Temperature (°F)	114	63.3	16.8
Stack Diameter (ft)	13.5	13.5	13.5
Exhaust Flow (lb/hr)	1345262	1429908	1442911
CTG Load Level	75%	75%	75%
Evap. Cooler	OFF	OFF	OFF

Data from Vendor Area = 143.14 ft^2

Expected Operation of each Gas Turbine - Normal Operation

(Reference: Emission Summary GE LMS100 PA Turbine/Site Specific (372 elev) Information)

Heat Consumed (MMBTU/hr)	708.8	737.2	724.8
Turbine Outlet Temperature (°F)	800	766	746
Exhaust Flow (acfm)	721939	746033	737502
Stack Exit Velocity, ft/m	5043.6	5212.0	5152.4
Stack Exit Velocity, m/s	25.6	26.5	26.2
Nitrogen, % Vol	72.33	72.54	73.20
Oxygen, % Vol	12.11	12.32	12.66
Carbon Dioxide, % Vol	3.72	3.64	3.56
Argon, % Vol	0.86	0.87	0.88
Water Vapor, % Vol	10.96	10.62	9.69
Molecular Weight	28.08	28.11	28.21

Data from Vendor

Average Emission Rates from each Gas Turbine (lbs/hr/turbine) - Normal Operations

NO_X at 28 ppmvd pre-BACT level	68.50	70.80	69.30
NO_X at 2.5 ppmvd BACT level	6.12	6.32	6.19
CO at 105 ppmvd pre BACT level	155.10	161.40	157.90
CO at 6.0 ppmvd BACT level	8.86	9.22	9.02
VOC at 3-4.2 ppmvd pre-BACT level	2.70	2.90	4.30
VOC at 2.0 ppmvd BACT level	1.80	1.93	2.05
SO_2 short-term rate	1.48	1.54	1.52
SO_2 annual rate	0.63	0.66	0.65
PM_{10}	6.00	6.00	6.00
NH_3 at 10 ppmvd tBACT level	9.10	9.40	9.20
Sulfur content in fuel basis for above:	0.75	grain total S/100 scf	short-term
Sulfur content in fuel basis for above:	0.32	grain total S/100 scf	long-term

Data from Vendor
Part load cases assume no evap cooling

Startup / Shutdown Emissions from Turbine

Startup

duration in minutes	10	20	30	30	Average	1 hour of
	Startup	CR Warmu	Total Startup	Normal	Startup	Startup
	Emissions	Emissions	Emissions	Emissions	Emissions	Emissions
	lb/event	**lb/event**	**lb/event**	lb/hour	lb/hour	lb/hour
NO_x	5.00	17.30	22.30	6.32	25.46	44.6
CO	14.00	39.30	53.30	9.22	57.91	106.6
VOC	3.00	0.80	3.80	2.05	4.82	7.6
SO_2	0.04	0.24	0.28	1.54	1.05	0.56
PM_{10}	1.00	2.00	3.00	6.00	6.00	6

Assumptions:

Startup Emissions for CO, NO_2, PM_{10}, and VOC integrated from data provided by GE and Bibb.

SO_2 emissions assume complete conversion of all sulfur to SO_2.

Shutdown

duration in minutes	10.5	49.5		1 hour of
	Shutdown	Normal	Total Shutdown	Shutdown
	Emissions	Emissions	Emissions	Emissions
	lb/event	lb/hour	lb/hr	lb/hour
NO_x	6.00	6.32	11.22	34.3
CO	47.00	9.22	54.61	268.6
VOC	3.00	2.05	4.69	17.1
SO_2	0.03	1.54	1.31	0.2
PM_{10}	1.05	6.00	6.00	6.0

Assumptions:

Shutdown Emissions for CO, NO_2, PM_{10}, and VOC integrated from data provided by GE and Bibb.

SO_2 emissions assume complete conversion of all sulfur to SO_2.

Worst-Case 1-Hour Emissions per Turbine

Worst-Case 1-Hour Emissions are equal to the uncontrolled emission rates for NO_2, CO, and SO_2. For VOC the worst-case 1-hour is shutdown and for PM_{10} the worst-case hour is startup.

Emissions per turbine	**lb/hr**										**g/s**
NO_2	70.80										8.92
CO	161.40										20.34
VOC	4.69										0.59
SO_2	1.54										0.19
PM_{10}	6.00										0.76

Worst-Case 3 Hour Emission Rate per Turbine

Only SO_2 is considered for an average 3-hour Ambient Air Quality Standard.

Worst-case 3-Hour Scenario are equal to 3 hours at normal rate.

Emissions per turbine	Worst-case Total	Startup /Warmup	Shutdown		Normal Operations	Worst-case Total	Startup /Warmup	Shutdown		Normal Operations	Worst-case Total
	lb/hr					Total lbs					g/s
Total Hours of Operation	3				3		0	0		3	
SO_2	1.54				1.54	4.63	0.00	0.00		4.63	0.19

Worst-Case 8-Hour Emission Rates

Only CO is considered for an average 8-hour Ambient Air Quality Standard.

Worst-case 8-Hour Scenario includes 2 Startups, 2 Shutdown, and remaining time at Normal rate.

Emissions per turbine	Worst-case Total	Startup /Warmup	Shutdown		Normal Operations	Worst-case Total	Startup /Warmup	Shutdown		Normal Operations	Worst-case Total
	lb/hr					Total lbs					g/s
Total Hours of Operation	8	1.00	0.350		6.65		1.00	0.35		6.65	
CO	32.74	106.60	268.57		9.22	261.93	106.60	94.00		61.33	4.13

Worst-Case 24 Hour Emission Rate

Only SO_2 and PM_{10} are considered for an average 24-hour Ambient Air Quality Standard.

Worst-case 24-Hour Scenario includes 3 Startups, 3 Shutdowns, and remaining time at Normal rate.

Emissions per turbine	Worst-case Total	Startup /Warmup	Shutdown		Normal Operations	Worst-case Total	Startup /Warmup	Shutdown		Normal Operations	Worst-case Total
	lb/hr					Total lbs					g/s
Total Hours of Operation	24	1.50	0.525		21.975		1.5	0.525		21.975	
NO_X	9.33	44.60	34.29		6.32	223.81	66.90	18.00		138.91	1.17
CO	20.98	106.60	268.57		9.22	503.57	159.90	141.00		202.67	2.64
VOC	2.72	7.60	17.14		2.05	65.40	11.40	9.00		45.00	0.34
SO_2	1.45	0.56	0.19		1.54	34.84	0.84	0.10		33.90	0.18
PM_{10}	6.00	6.00	6.00		6.00	144.00	9.00	3.15		131.85	0.76

Average Annual Emissions

Average Operation Emission Rates are based on the average operation scenario (63°F; 100% load) for 5,000 hours total operations which includes 365 startup/warmup events and 365 shutdown events and 20 maintenance hours. The four turbines will each have these operating conditions.

Emissions per turbine	Worst-case Total	Startup /Warmup	Shutdown		Normal Operations	Worst-case Total	Startup /Warmup	Shutdown		Normal Operations	Worst-case Total
	lb/hr					Total lbs					g/s
Total Hours of Operation	5000	182.50	63.88		4753.63						
Number per Scenario		365	365		0						
Duration of Event (min)		30	10.5		60						
NO_X	4.61	44.60	34.29		6.32	40379.2	8139.5	2190.0		30049.7	0.58
CO	9.18	106.60	268.57		9.22	80451.5	19454.5	17155.0		43842.0	1.16
VOC	1.39	7.60	17.14		2.05	12215.6	1387.0	1095.0		9733.6	0.18
SO_2	0.85	0.56	0.19		1.54	7447.5	102.2	11.9		7333.4	0.11
PM_{10}	3.42	6.00	6.00		6.00	30000.0	1095.0	383.3		28521.8	0.43

Note: Worst-case lb/hr is the total emissions (lbs) over 8760 hours/year

Estimated annual normal operating hours 4754

PEC Turbines 50%

Case	103	106	109
Ambient Temperature (°F)	114	63.3	16.8
Stack Diameter (ft)	13.5	13.5	13.5
Exhaust Flow (lb/hr)	1079315	1134608	1143414
CTG Load Level	50%	50%	50%
Evap. Cooler	OFF	OFF	OFF

Data from Vendor Area = 143.14 ft^2

Expected Operation of each Gas Turbine - Normal Operation

(Reference: Emission Summary GE LMS100 PA Turbine/Site Specific (372 elev) Information)			
Heat Consumed (MMBTU/hr)	535.0	557.6	548.9
Turbine Outlet Temperature (°F)	804	783	765
Exhaust Flow (acfm)	578809	598001	591948
Stack Exit Velocity, ft/m	4043.7	4177.8	4135.5
Stack Exit Velocity, m/s	20.5	21.2	21.0
Nitrogen, % Vol	72.99	73.12	73.77
Oxygen, % Vol	12.89	12.97	13.28
Carbon Dioxide, % Vol	3.42	3.39	3.32
Argon, % Vol	0.87	0.87	0.88
Water Vapor, % Vol	9.82	9.63	8.73
Molecular Weight	28.18	28.20	28.29

Data from Vendor

Average Emission Rates from each Gas Turbine (lbs/hr/turbine) - Normal Operations

NO_X at 28 ppmvd pre-BACT level	50.30	51.20	51.60	
NO_X at 2.5 ppmvd BACT level	4.49	4.57	4.61	
CO at 105 ppmvd pre BACT level	113.30	119.10	116.10	
CO at 6.0 ppmvd BACT level	6.47	6.81	6.63	
VOC at 2-3 ppmvd pre-BACT level	1.10	1.10	2.30	
VOC at 2.0 ppmvd BACT level	1.10	0.92	1.53	
SO_2 short-term rate	1.12	1.17	1.15	
SO_2 annual rate	0.48	0.50	0.49	
PM_{10}	6.00	6.00	6.00	
NH_3 at 10 ppmvd tBACT level	6.60	6.80	6.80	
Sulfur content in fuel basis for above:	0.75	grain total S/100 scf		short-term
Sulfur content in fuel basis for above:	0.32	grain total S/100 scf		long-term

Data from Vendor
Part load cases assume no evap cooling

Startup / Shutdown Emissions from Turbine

Startup

duration in minutes	10	20	30	30	Average	1 hour of
	Startup	SCR Warmup	Total Startup	Normal	Startup	Startup
	Emissions	Emissions	Emissions	Emissions	Emissions	Emissions
	lb/event	**lb/event**	**lb/event**	lb/hour	lb/hour	lb/hour
NO_X	5.00	17.30	22.30	4.61	24.60	44.6
CO	14.00	39.30	53.30	6.81	56.70	106.6
VOC	3.00	0.80	3.80	1.53	4.57	7.6
SO_2	0.04	0.24	0.28	1.17	0.86	0.56
PM_{10}	1.00	2.00	3.00	6.00	6.00	6

Assumptions:

Startup Emissions for CO, NO_2, PM_{10}, and VOC integrated from data provided by GE and Bibb.

SO_2 emissions assume complete conversion of all sulfur to SO_2.

Shutdown

duration in minutes	10.5	49.5		1 hour of
	Shutdown	Normal	Total Shutdown	Shutdown
	Emissions	Emissions	Emissions	Emissions
	lb/event	lb/hour	lb/hr	lb/hour
NO_X	6.00	4.61	9.80	34.3
CO	47.00	6.81	52.61	268.6
VOC	3.00	1.53	4.27	17.1
SO_2	0.03	1.17	1.00	0.2
PM_{10}	1.05	6.00	6.00	6.0

Assumptions:

Shutdown Emissions for CO, NO_2, PM_{10}, and VOC integrated from data provided by GE and Bibb.

SO_2 emissions assume complete conversion of all sulfur to SO_2.

Worst-Case 1-Hour Emissions per Turbine

Worst-Case 1-Hour Emissions are equal to the uncontrolled emission rates for NO_2, CO, and SO_2. For VOC the worst-case 1-hour is shutdown and for PM_{10} the worst-case hour is startup.

Emissions per turbine	**lb/hr**										**g/s**
NO_2	51.60										6.50
CO	119.10										15.01
VOC	4.57										0.58
SO_2	1.17										0.15
PM_{10}	6.00										0.76

Worst-Case 3 Hour Emission Rate per Turbine

Only SO_2 is considered for an average 3-hour Ambient Air Quality Standard.

Worst-case 3-Hour Scenario are equal to 3 hours at normal rate.

Emissions per turbine	Worst-case Total	Startup /Warmup	Shutdown		Normal Operations	Worst-case Total	Startup /Warmup	Shutdown		Normal Operations	Worst-case Total
	lb/hr					Total lbs					g/s
Total Hours of Operation	3				3						
SO_2	1.15				1.15	3.45				3.45	0.14

Worst-Case 8-Hour Emission Rates

Only CO is considered for an average 8-hour Ambient Air Quality Standard.

Worst-case 8-Hour Scenario includes 2 Startups, 2 Shutdowns, and remaining time at Normal rate.

Emissions per turbine	Worst-case Total	Startup /Warmup	Shutdown		Normal Operations	Worst-case Total	Startup /Warmup	Shutdown		Normal Operations	Worst-case Total
	lb/hr					Total lbs					g/s
Total Hours of Operation	8	1.00	0.350		6.650						
CO	30.73	106.60	268.57		6.81	245.86	106.60	94.00		45.26	3.87

Worst-Case 24 Hour Emission Rate

Only SO_2 and PM_{10} are considered for an average 24-hour Ambient Air Quality Standard.

Worst-case 24-Hour Scenario includes 2 Startups, 2 Shutdowns, 2 hours at Maintenance rate, and remaining time at Normal rate.

Emissions per turbine	Worst-case Total	Startup /Warmup	Shutdown		Normal Operations	Worst-case Total	Startup /Warmup	Shutdown		Normal Operations	Worst-case Total
	lb/hr					Total lbs					g/s
Total Hours of Operation	24	1.50	0.525		21.98						
NO_X	7.76	44.60	34.29		4.61	186.14	66.90	18.00		101.24	0.98
CO	18.61	106.60	268.57		6.63	446.69	159.90	141.00		145.79	2.35
VOC	1.86	7.60	17.14		1.10	44.57	11.40	9.00		24.17	0.23
SO_2	1.09	0.56	0.19		1.15	26.18	0.84	0.10		25.24	0.14
PM_{10}	6.00	6.00	6.00		6.00	144.00	9.00	3.15		131.85	0.76

Average Annual Emissions

Average Operation Emission Rates are based on the average operation scenario (63°F; 100% load) for 5,000 hours
which includes 365 startup/warmup events, 365 shutdown events, and 20 maintenance hours. The four turbines will each have these operating conditions.

Emissions per turbine	Worst-case Total	Startup /Warmup	Shutdown		Normal Operations	Worst-case Total	Startup /Warmup	Shutdown		Normal Operations	Worst-case Total
	lb/hr					Total lbs					g/s
Total Hours of Operation	5000	182.50	63.88		4754						
Number per Scenario		365	365		0						
Duration of Event (min)		30	10.5		60						
NO_X	3.68	44.60	34.29		4.61	32230.1	8139.5	2190.0		21900.6	0.46
CO	7.87	106.60	268.57		6.81	68961.3	19454.5	17155.0		32351.8	0.99
VOC	1.12	7.60	17.14		1.53	9770.9	1387.0	1095.0		7288.9	0.14
SO_2	0.65	0.56	0.19		1.17	5660.9	102.2	11.9		5546.8	0.08
PM_{10}	3.42	6.00	6.00		6.00	30000.0	1095.0	383.3		28521.8	0.43

Note: Worst-case lb/hr is the total emissions (lbs) over 8760 hours/year

Estimated annual normal operating hours 4754

Startup Shutdown

Transient Emissions Summary

LMS100 PA Estimated Startup / Shutdown Emissions at Package Exit

Tamb (°F / °C)		CO (lb)*	NOx (lb)*	VOC (lb)*	PM10 (lb)*	LHV Fuel MMBtu	SO2** lb
-30 / -34.4	Start	15	5	3	11	26	0.04
	Shutdown	59	6	3	11	33	0.05
59 / 15	Start	13	5	3	11	26	0.04
	Shutdown	35	6	3	11	33	0.05
78 / 25.5	Start	13	5	3	11	26	0.04
	Shutdown	29	6	3	11	33	0.05
90 / 32.2	Start	13	5	3	11	26	0.04
	Shutdown	29	6	3	11	33	0.05

* Margined average engine emissions - NOT A GUARANTEE

Notes: The table shown in the box above was provided by GE

Based on the table, the cold start CO used is 14 lb

All other startup values at all other ambients are a constant

Complete Start (Ignition to full compliance)		CO lb	NOx lb	VOC lb	PM10 lb	Fuel MMBtu	SO2** lb
Cold Day (16.8F)	Initial 10 minutes	14.0	5.0	3.0	11.0	26.0	0.04
	Final 20 minutes	39.2	17.1	0.8	3.7	152.4	0.24
	Total	53.2	22.1	3.8	14.7	178.4	0.28
Avg Day (63.3F)	Initial 10 minutes	13.0	5.0	3.0	11.0	26.0	0.04
	Final 20 minutes	39.3	17.3	0.4	3.7	153.8	0.24
	Total	52.3	22.3	3.4	14.7	179.8	0.28
Hot Day (114.0F)	Initial 10 minutes	13.0	5.0	3.0	11.0	26.0	0.04
	Final 20 minutes	37.8	16.6	0.4	3.7	147.6	0.23
	Total	50.8	21.6	3.4	14.7	173.6	0.27

** Based on a gas heating value (LHV) of 924 Btu/scf
and a maximum total sulfur content of 0.50 grains/100 scf

Cooling Tower Drift Calculation

Cooling Tower			
design circulating water rate	27,600	gallons/min	
cycles of concentration	3		
TDS	1700	mg/liter	
	14.19	lb/1000 gallons	
Drift Eliminator Control	0.000005		
Operating hours per year	5000		
Drift PM emissions	0.3524	lb/hr	total from all cells
	0.0881	lb/hr	from each cell (4 of 5 for short-term)
	0.0402246	lb/hr	from each cell (all 5 for long-term)
	0.8809	**tpy**	

Emissions from Emergency Diesel Firewater Pump

Rated Horsepower	**160**	**BHP**	
Testing duration	**60**	**min/week**	
Yearly testing	**52**	**week/year**	
Expected non-emergency usage	**52**	**hr/yr**	
Diesel Fired	Emision Factor	Emission Rate per Testing	Yearly Emission Rate
	g/HP/Hr	lb/hr	lb/yr
NO_X	3.90	1.38	71.54
CO	0.66	0.23	12.11
VOC (Total Hydrocarbons)	1.00	0.35	18.34
SO_X		2.26E-03	0.12
PM_{10}	0.15	0.05	2.75

Engine parameters

Flow Rate (acfm)	1235	
Exhaust Temp (degrees F)	872	
Stack Diameter (feet)	0.5052	
Stack height (feet)	17	(13 ft building + 4 ft stack)

Data from Bibb
Sulfur content 15 ppm in fuel

Plant Operating Scenarios

1-Hour Worst-Case Emission Scenario for PEC

Only NO_2, CO and SO_2 are considered for the 1-hour Ambient Air Quality Standard.

Worst-case 1-Hour Scenario for NO_2 and CO includes new turbines operating for 1 hour at highest commissioning rate.

Worst-case 1-Hour Scenario for SO_2 includes new turbines operating for 1 hour at highest normal rate.

Fire Pump operates 1 hour per week.

Emissions per turbine	lb/hr	g/s
NO_2	168.06	21.18
CO	305.63	38.51
SO_2	1.90	0.24
Emissions from Fire Pump		
NO_2	1.38	0.17
CO	0.23	0.03
SO_2	2.26E-03	2.85E-04

3 Hour Emissions Scenarios for PEC

Only SO_2 is considered for an average 3-hour Ambient Air Quality Standard.

The worst-case 3-hour emission rate is the maximum SO_2 rate for 100% load, normal operating case.

Fire Pump operates 1 hour per week.

Emissions per turbine	lb/hr	g/s
SO_2	1.90	0.24
Emissions from Fire Pump		
SO_2	7.53E-04	9.48E-05

8-Hour Emissions Scenarios for PEC

Only CO is considered for an average 8-hour Ambient Air Quality Standard.

Worst-case 8-Hour Scenario includes 8 hours of commissioning. Fire Pump operates 1 hour per week.

Emissions per turbine	lb/hr	g/s
CO	305.63	38.51
Emissions from Fire Pump		
CO	2.82E-04	3.56E-05

24-Hour Emissions Scenarios for PEC

Only SO_2 and PM_{10} are considered for an average 24-hour Ambient Air Quality Standard.

Worst-case 24-Hour Scenario for PM_{10} includes 3 Startups, 3 Shutdowns, and remaining time at normal rate.

SO2 uses normal operating rate. Fire Pump operates 1 hour per week.

Emissions per turbine	lb/hr	g/s
NO_2	10.89	1.37
CO	23.35	2.94
VOC	3.29	0.41
SO_2	1.90	0.24
PM_{10}	6.00	0.76
Emissions from Cooling Tower	**lb/hr**	**g/s**
PM_{10}	0.35	0.04
Emissions from Fire Pump		
SO_2	9.41E-05	1.19E-05
PM_{10}	2.20E-03	2.78E-04

Average Annual Emissions for PEC

Average Annual Emission Rates presented in this table are based on 8,760 hours even though the PEC facility will operate no more than 5,000 hours annually. The totals include 365 startup/warmup and 365 shutdown events Fire Pump operates 52 hours per year. Cooling tower operates 5,000 hours per year.

Emissions per turbine	lb/hr	g/s
NO_X	5.53	0.70
CO	10.59	1.33
VOC	1.73	0.22
SO_2	1.09	0.14
PM_{10}	3.42	0.43
Emissions from Cooling Tower		
PM_{10}	0.20	0.03
Emissions from Fire Pump		
NO_2	8.17E-03	1.03E-03
CO	1.38E-03	1.74E-04
VOC	2.09E-03	2.64E-04
SO_2	1.34E-05	1.69E-06
PM_{10}	3.14E-04	3.96E-05

TECHNICAL AREA: AIR QUALITY

Data Request 3 Rev: Please provide any other revised project information that was provided to the District but not included in the October 30, 2006 AFC Supplement.

Response:

Applicant is providing correspondence from the district as well as correspondence to the District in order to fully understand the content of the correspondence.

The following table lists the information, including copies of e-mails, that is included in this response:

Air District Correspondence Table

Date	Description	Attachment ID	Comments
September 11, 2006	District "Incompleteness" Letter	Attachment 1	2 Pages, Single .pdf doc
October 5, 2006	Email from James Harader of District defining how Inter-pollutant Offset ratio is calculated	Attachment 2	3 Pages, Single .pdf doc
October 11, 2006	PEC response letter to District "Incompleteness" letter with attachments (Attachment A – Emissions, Attachment B – ERCs, Attachment C – ERC Offset Ratio Analysis)	Attachment 3	19 Pages, Single .pdf doc
December 15, 2006	Email from James Harader at District on Fuel Sulfur Content	Attachment 4	5 Pages, Single .pdf doc
December 19, 2006	Email to District for "cumulative modeling analysis"	Attachment 5	1 Page, Single .pdf doc

Attachment 1

San Joaquin Valley
Air Pollution Control District

TO: GC/KD
SEP 14 2006

SEP 11 2006

Gary Chandler
Panoche Energy Center, LLC
63 Kendrick Street
Needham, MA 02494

Re: Notice of Incomplete Application
Project Number: C-1062518

Dear Mr. Chandler:

The District has received your Authority to Construct application for the installation of a 400 MW powerplant, at West Panoche Road, in Firebaugh, CA. Based on our preliminary review, the application has been determined to be incomplete. The following information is required prior to further processing:

1. Your request for 20 hours of operation of each turbine for maintenance, without emission controls, does not meet District BACT Guideline 3.4.7 requirements. Therefore, please revise your proposal.

2. Please provide a cost estimate for the purchase and operation of an oxidation catalyst capable of achieving VOC emissions of 0.6 ppmvd @ 15% O_2.

3. Please provide your revised hourly, daily, and annual PM10 emission estimates.

4. Please identify a source of offsets, citing specific Emission Reduction Credit (ERC) certificate numbers to be used to offset the project's emissions. If the facility is currently not the owner of the identified ERC's, please provide the District with justification that the facility has the right to use the ERC's (i.e. a purchase option/contract or similar document).

5. Please provide a SOx/PM10 interpollutant offset ratio analysis along with the proposed interpollutant offset ratio. Please be aware that the EPA has expressed the opinion that SOx credits can't be used to offset PM10 emissions. The District disagrees with EPA and is pursuing a reversal of EPA's opinion.

Seyed Sadredin
Executive Director / Air Pollution Control Officer

Northern Region Office
4800 Enterprise Way
Modesto, CA 95356-8718
(209) 557-6400 • FAX (209) 557-6475

Central Region Office
1990 East Gettysburg Avenue
Fresno, CA 93726-0244
(559) 230-6000 • FAX (559) 230-6061
www.valleyair.org

Southern Region Office
2700 M Street, Suite 275
Bakersfield, CA 93301-2373
(661) 326-6900 • FAX (661) 326-6985

Mr. Chandler
Page 2

In response, please refer to the above project number, and send to the attention of Mr. James Harader.

Please submit the requested information within 30 days. The District will not be able to process your application until this information is received. Please note that the District's Small Business Assistance (SBA) office is available to assist you in this matter. You may contact an SBA engineer at (559) 230-5888.

Thank you for your cooperation in this matter. If you have any questions, please contact Mr. James Harader at (559) 230-5887.

Sincerely,

David Warner
Director of Permit Services

Arnaud Marjollet
Permit Services Manager
DW:jh

CC: John Lague
URS Corporation
1615 Murray Canyon Road, Suite 1000
San Diego, CA 92108

Dave Jenkins
Cinergy Services Inc.
1000 East Main Street
Plainfield, IN 46168-1782

Attachment 2

Gmail -talk BETA

David Jenkins <davdjenk@gmail.com>

Panoche Questions

John_Lague@urscorp.com <John_Lague@urscorp.com> **Thu, Oct 5, 2006 at 6:44 AM**
To: James.Harader@valleyair.org
Cc: davdjenk@gmail.com

Hi, James

We are preparing the response to the District's completeness letter on the PEC, and two questions have come up.

Do PM10 emissions from the cooling tower and from the emergency firewater pump engine have to be offset, or just the turbine emissions?

If an interpollutant offset is used, how does SJVAPCD require the combination of distance factor and interpollutant factor to be calculated in order to determine the required offset amount. In other words, are the project emissions multiplied by the greater of the two factors, the sum of the two factors or the product of the two factors?

Thanks and best regards - jsl

John Lague
Senior Air Quality Consultant
URS Corporation
1615 Murray Canyon Road, Suite 1000
San Diego, California 92108
Phone: (619) 294-9400
Fax: (619) 293-7920

Gmail -talk BETA

David Jenkins <davdjenk@gmail.com>

Panoche Questions

John_Lague@urscorp.com <John_Lague@urscorp.com> **Thu, Oct 5, 2006 at 8:02 AM**
To: davdjenk@gmail.com

Dave

Please note this email from SJVAPCD about how to calculate interpollutant credit requirements. It looks like you need to get more SO2 than you indicated in Response No 4 in your letter. Also, James is asking a question at the end of his email that I don't know how to answer.

Thanks - jsl

John Lague
Senior Air Quality Consultant
URS Corporation
1615 Murray Canyon Road, Suite 1000
San Diego, California 92108
Phone: (619) 294-9400
Fax: (619) 293-7920

----- Forwarded by John Lague/SanDiego/URSCorp on 10/05/2006 08:59 AM -----

James Harader <James.Harader@valleyair.org>
10/05/2006 08:54 AM

To: "'John_Lague@URSCorp.com"' <John_Lague@URSCorp.com>, James Harader <James.Harader@valleyair.org>
cc: davdjenk@gmail.com
Subject: RE: Panoche Questions

John,

The emergency firewater pump engine is exempt from offsets. Our rule only requires offsets above the offset threshold. The quantity of offsets required, before factoring in the distance and interpollutant ratios, is:

Offsets(PM10, without ratios) = [Turbine emissions + Cooling Tower Emissions
- 29,200 lb/year]

When factoring in the distance ratio and the interpollutant ratio, we use the product. The quantity of PM10 offsets required, factoring in the ratios, is:

Offsets Required (PM10, with ratios) = [Turbine emissions + Cooling Tower Emissions - 29, 200 lb/year] x Distance Ratio x Interpollutant Ratio

I have been assigned two ERC transfer projects for the transfer of SOx credits from J R Simplot to Panoche Energy Center. Since these credits were
generated in our Northern Region, I will have to create a placeholder facility in our database for the credits. My question is, since you also have the Bullard Project as well, I would think we want to create only one place holder for the credits rather than two. What do you want the facility name to be for the placeholder??

Regards,

James Harader
Air Quality Engineer II
San Joaquin Valley APCD
(559) 230-5887
[Quoted text hidden]

Attachment 3

Panoche Energy Center, LLC

October 11, 2006

David Warner
Director of Permit Section
1990 East Gettysburg Avenue
San Joaquin Valley Air Pollution Control District
Central Region Office
Fresno, CA 93726-0244

Re: Project No. C-1062518, Response to *Notice of Incomplete Application*

Dear Mr. Warner,

On behalf of Panoche Energy Center, LLC, (PEC) this letter serves as a response to your letter dated September 11, 2006 regarding the SJVAPCD's *Notice of Incomplete Application*. PEC respectfully responds to the five items your letter raised as follows:

1. PEC understands that the District does not intend to allow 20 hours of maintenance operation without the CO catalyst and SCR. Accordingly, all future representations of the project's potential to emit will be based on normal, controlled operation for these hours. A spreadsheet showing the revised emissions for all pollutants is provided as *Attachment A – Revised PEC Criteria Emissions*. This revised project inventory also incorporates the change in turbine PM_{10} emission rates discussed in Response No. 3 below, as well as a change in the assumed long-term average natural gas sulfur content to 0.32 grains total sulfur per 100 dry standard cubic feet (gr/100 dscf). The latter change was suggested by CEC in its review of the AFC for this project. For averaging times of 24 hours and less, we are continuing to use a worst-case sulfur content of 0.50 gr/100 dscf.

2. To achieve additional reduction of VOC emissions from 2.0 (as requested in the PEC application) to 0.6 ppmvd @ 15% O_2, additional capital costs are estimated by the SCR supplier, Deltak, to be $250,000 per unit, or $1,000,000 for all four units. Assuming full load for 5000 hours per year per unit, a 0.6 ppmvd emission rate would produce 11 tons/yr of VOC, compared to 25 tons/yr at 2.0 ppmvd. The net annual VOC reduction would be 14 tons/yr. In simple terms that exclude added O&M costs, the cost-per-ton of VOC reductions is estimated to be $14,286. This per-ton cost is significantly above the recent history VOC ERC market price on a per-ton basis. As such, PEC recommends that the proposed VOC emission rate of 2.0 ppmdv @ 15% O2 be accepted as BACT.

3. Since the submittal of the original ATC application, PEC has secured guarantee from the LMS100 manufacturer, General Electric, that PM_{10} emissions will not exceed 6.0 lb/hr/turbine. As shown in *Attachment A*, the estimated maximum hourly, daily and 24-hourly PM_{10} emissions rates for the project with this change, including the contributions of the four turbines, cooling tower and firewater pump, are as follows:

Maximum hourly PM_{10} emissions:	24.40 pounds
Maximum daily PM_{10} emissions:	584.45 pounds
Maximum annual PM_{10} emissions:	60.88 tons

4. PEC believes that it has secured the needed ERCs to offset projected emissions identified its application to the SJVAPCD. ERC certificate numbers and related information are shown in *Attachment B – Emission Reduction Certificates*. It is important to note that while Agreements between PEC and the Certificate holders have been executed for all these certificates, several transactions are pending with the District, while others will not transacted until the option to purchase period expires (December 2007 at the latest). Also of note, PEC applied 99.480 tons of SO_x for 55.265 tons of PM10. In addition to applying the 1.5 distance ratio, a 1.8 inter-pollutant ratio was applied, as described in Response No. 5 below.

5. PEC intends to meet all or part of its PM_{10} emissions offset requirement using inter-pollutant credits, specifically SO_x credits. Accordingly, an analysis was conducted to derive an appropriate inter-pollutant ratio for application of SO_x ERCs to offset project PM_{10} emissions, using an approach that was recommended to URS by SJVAPCD for another project earlier this year. This method uses monitoring data and the results of chemical mass balance modeling developed by SJVAPCD. In this case only data for Fresno County were used. The summary of this analysis is provided as *Attachment C- NOx/PM_{10} and SO_2/PM10 Inter-pollutant Offset Ratio*, which provides the rationale for a proposed inter-pollutant ratio (SO_2 to PM_{10}) of 1.8 to 1. While not requested by SJVAPCD, a comparable analysis was conducted to determine an appropriate ratio for the use of NO_x credits to satisfy PM_{10} offset requirements, which is also presented in Supplement C. The result for this calculation was a NO_x/PM_{10} ratio of 3.0.

I appreciate your attention to PEC's application, and trust that this response will meet the District's requirements for "completeness." Please do not hesitate to contact John Lague (URS) for matters related to Items 1, 3 and 5 above, and Dave Jenkins (PEC) for Items 2 and 4. It is my expectation that one or both will contact you and your staff soon to setup a follow-up discussion.

Respectfully,

Gary R. Chandler,

President, Panoche Energy Center, LLC
P.O. Box 95592
South Jordan, Utah 84095

Attachments: A -*Revised PEC Criteria Emissions; B- Emission Reduction Certificates, and C- NOx/PM_{10} and SO_2/PM10 Inter-pollutant Offset Ratio.*
CC: Arnaud Marjollet, Errol Villegas, James Harader - SJVAPCD
David Jenkins, Mikael King - PEC
Lohn Laque, Cindy Poire - URS Corp.

Attachment A: Revised PEC Criteria Pollutant Emissions

Case	100	101	104	107
Ambient Temperature (°F)	114	114	63.3	16.8
Stack Diameter (ft)	13.5	13.5	13.5	13.5
Exhaust Flow (lb/hr)	1496922	1584697	1669071	1710822
CTG Load Level	100%	100%	100%	100%
Evap. Cooler	OFF	ON	OFF	OFF

Data from Vendor Area = 143.14 ft^2

Expected Operation of Each Gas Turbine - Normal Operation

(Reference: Emission Summary GE LMS100 PA Turbine/Site Specific (372 elev) Information)

Heat Consumed (MMBTU/hr)	813.8	862.5	909.7	885.2
Turbine Outlet Temperature (°	817	801	787	741
Exhaust Flow (acfm)	816088	854672	886554	873723
Stack Exit Velocity, ft/m	5701.4	5870.9	6207.6	6104.0
Stack Exit Velocity, m/s	28.96	29.33	31.53	31.01
Nitrogen, % Vol	71.82	71.54	71.84	72.68
Oxygen, % Vol	11.51	11.43	11.49	12.08
Carbon Dioxide, % Vol	3.95	3.95	3.96	3.78
Argon, % Vol	0.86	0.86	0.86	0.87
Water Vapor, % Vol	11.85	12.20	11.83	10.57
Molecular Weight	28.01	27.97	28.01	28.13

Data from Vendor

Average Emission Rates from Each Gas Turbine (lbs/hr) - Normal Operations

NO_x at 28 ppmvd pre-BACT le	80.60	85.40	89.90	87.20
NO_x at 2.5 ppmvd BACT level	7.20	7.63	8.03	7.79
CO at 105 ppmvd pre BACT le	183.10	196.60	206.60	200.40
CO at 6.0 ppmvd BACT level	10.46	11.23	11.81	11.45
UHC at 4-7 ppmvd pre-BACT l	4.50	4.80	5.70	8.60
VOC at 2.4-4.2 ppmvd BACT le	3.00	3.20	3.30	5.10
VOC at 2.0 ppmvd BACT level	2.00	2.67	2.20	2.43
SO_2 short-term rate	1.14	1.20	1.27	1.23
SO_2 annual rate	0.73	0.77	0.81	0.79
PM_{10}	6.00	6.00	6.00	6.00
NH_3 at 10 ppmvd tBACT level	10.70	11.30	11.90	11.50
NH_3 at 6 ppmvd BACT level	6.42	6.78	7.14	6.90
Sulfur content in fuel basis for al	0.5	grain total :	short-term	
Sulfur content in fuel basis for al	0.32	grain total :	long-term	

Data from Vendor

Startup / Shutdown Emissions from Turbine

Startup						
duration in minutes	10	20	30	30	Average	1 hour of
	Startup	CR Warm	Total Startup	Normal	Startup	Startup
	Emissions	Emissions	Emissions	Emissions	Emissions	Emissions
	lb/event	lb/event	lb/event	lb/hour	lb/hour	lb/hour
NO_x	5.00	17.20	22.20	8.03	23.21	44.4
CO	14.00	39.30	53.30	11.81	59.20	106.6
VOC	3.00	0.80	3.80	2.67	5.13	7.6
SO_2	0.04	0.24	0.28	1.27	0.91	0.56
PM_{10}	1.00	2.00	3.00	6.00	6.00	6

Assumptions:

Startup Emissions for CO, NO_2, PM_{10}, and VOC integrated from data provided by GE and Bibb.

SO_2 emissions assume complete conversion of all sulfur to SO_2.

Normal emissions are highest of four operating cases listed above (case 104), except for VOC.

Shutdown

duration in minutes	10.5	49.5		1 hour of
	Shutdown	Normal	Total Shutdown	Shutdown
	Emissions	Emissions	Emissions	Emissions
	lb/event	lb/hour	lb/hr	lb/hour
NO_x	6.00	8.03	12.62	34.3
CO	47.00	11.81	56.74	268.6
VOC	3.00	2.67	5.20	17.1
SO_2	0.05	1.27	1.10	0.3
PM_{10}	1.05	6.00	6.00	6.0

Assumptions:

Shutdown Emissions for CO, NO_x, PM_{10} and VOC integrated from data provided by GE and Bibb.

SO_2 emissions assume complete conversion of all sulfur to SO_2.

Normal emissions are highest of four operating cases listed above (case 104) except for VOC.

Commissioning Emissions

			Total Pounds Emitted			
	Hours	NO_x	CO	VOC	PM_{10}	SO_2
First Fire	28	1371.00	800.00	17.00	168.00	3
Controlled Break-in	20	1236.00	721.00	15.00	120.00	3
Dynamic AVR	24	4488.00	4553.00	98.00	144.00	18
Base Load AVR	16	1274.00	4956.00	106.00	96.00	20
SCR Commissioning	24	849.00	215.00	43.00	144.00	30
Full Load Testing	24	191.00	266.00	53.00	144.00	30
Total Commissioning Hours	136					
		Maximum Emission Rates lb/hr				
		NO_x	CO	VOC	PM_{10}	SO_2
First Fire		48.96	28.57	0.61	6.00	0.11
Controlled Break-in		61.80	36.05	0.75	6.00	0.15
Dynamic AVR		187.00	189.71	4.08	6.00	0.75
Base Load AVR		79.63	309.75	6.63	6.00	1.25
SCR Commissioning		35.38	8.96	1.79	6.00	1.25
Full Load Testing		7.96	11.08	2.21	6.00	1.25

Worst-Case 1-Hour Emissions per Turbine

Worst-Case 1-Hour Emissions are equal to the commissioning emission rates, except for SO_2 which has worst-case emissions during normal operations and PM_{10} which has worst-case emissions during startup.

Emissions per turbine	lb/hr	g/s
NO_x	187.00	23.56
CO	309.75	39.03
VOC	6.63	0.83
SO_2	1.27	0.16
PM_{10}	6.00	0.76

Worst-Case 3 Hour Emission Rate per Turbine

Only SO_2 is considered for an average 3-hour Ambient Air Quality Standard.

Worst-case 3-Hour Scenario are equal to 3 hours at normal rate.

Emissions per turbine	Worst-case Total	Startup /Warmup	Shutdown		Normal Operations	Worst-case Total	Startup /Warmup	Shutdown		Normal Operations	Worst-case Total
	lb/hr						Total lbs				g/s
Total Hours of Operation	3.0				3.000					3.000	
SO_2	1.27				1.27	3.81				3.81	0.16

Worst-Case 8-Hour Emission Rates

Only CO is considered for an average 8-hour Ambient Air Quality Standard.

Worst-case 8-Hour Scenario includes 8 hours of commissioning. Only one turbine will be undergoing commissioning at any one time.

Emissions per turbine	Worst-case Total	Startup /Warmup	Shutdown	Commissioning	Normal Operations	Worst-case Total	Startup /Warmup	Shutdown	Normal Operations	Commissioning	Normal Operations	Worst-case Total
	lb/hr					Total lbs						g/s
Total Hours of Operation	8			8	0					8	0.00	
CO	309.75			308.75	0.00	2478.00				2478.00	0.00	39.03

Worst-Case 24 Hour Emission Rate

Only SO_2 and PM_{10} are considered for an average 24-hour Ambient Air Quality Standard.

Worst-case 24-Hour Scenario for PM_{10} includes 3 Startups, 3 Shutdowns, and remaining time at normal rate.

Worst-case 24-hour scenario for SO_2 uses normal operations.

Emissions per turbine	Worst-case Total	Startup /Warmup	Shutdown	Normal Operations	Worst-case Total	Startup /Warmup	Shutdown	Normal Operations	Worst-case Total
	lb/hr				Total lbs				g/s
Total Hours of Operation	24	1.50	0.525	21.975		1.50	0.525	21.975	
NO_x	10.87	44.40	34.29	8.03	260.99	66.60	18.00	176.39	1.37
CO	23.35	106.60	268.57	11.81	560.33	159.90	141.00	259.43	2.94
VOC	3.29	7.60	17.14	2.67	79.00	11.40	9.00	58.60	0.41
SO_2	1.27			1.27	27.89	0.00	0.00	27.89	0.16
PM_{10}	6.00	6.00	6.00	6.00	144.00	9.00	3.15	131.85	0.76
SO_2 Commissioning		**PM_{10} Commissioning**							
First Fire	0.11	First Fire	6.00						
Controlled Break-in	0.15	Controlled	6.00						
Dynamic AVR	0.75	Dynamic A	6.00						
Base Load AVR	1.25	Base Load	6.00						
SCR Commissioning	1.25	SCR Comm	6.00						
Full Load Testing	1.25	Full Load T	6.00						

CTG Commissioning testing could operate for 24 hours.

Commissioning

	First Fire	Controlled Break-in	Dynamic AVR	Base Load AVR	SCR Commissioning	Full Load
	Emissions	Emissions	Emissions	Emissions	Emissions	Emissions
		Total lbs				
	28	20	24	16	24	24
	1371	1236	4488	1274	849	191
	800	721	4563	4956	215	266
	17	15	96	106	43	53
	3	3	18	20	24	30
	308	220	264	176	264	264

Average Annual Emissions

Average Operation lb/hr Emission Rates presented below for normal operations are based on the 63°F, 100% load operation scenario for 5,000 total operating hours, which includes 365 startup/warmup events and 365 shutdown events. Worst-case total emission rate incorporates estimated operating hours at different temperatures.

Emissions per turbine	Worst-case Total	Startup /Warmup	Shutdown	Normal Operations	Worst-case Total	Startup /Warmup	Shutdown	Normal Operations	Worst-case Total
	lb/hr				Total lbs				g/s
Total Hours of Operation	5000	182.50	63.88	4753.63					
Number per Scenario		365	365						
Duration of Event (min)		30	10.5	60					
NO_x	5.53	44.40	34.29	8.03	48449.3	8103.0	2190.0	38156.3	0.70
CO	10.59	106.60	268.57	11.81	92729.4	19454.5	17455.0	56119.9	1.33
VOC	1.73	7.60	17.14	2.67	15158.3	1387.0	1095.0	12676.3	0.22
SO_2	0.45	0.56	0.29	0.81	3991.9	102.2	18.6	3861.0	0.06
PM_{10}	3.42	6.00	6.00	6.00	30000.0	1095.0	383.3	28521.8	0.43

Note: Worst-case lb/hr is the total emissions (lbs) over 8760 hours/year

mated annual normal operating h	4754			turbines + fire pump		turbines + fire pump	cooling tower +
ANNUAL TOTALS	1 unit	4 units			tpy		
NO_x	24.22	96.90	tpy	96.93	tpy	96.93	tpy
CO	46.36	185.46	tpy	185.46	tpy	185.46	tpy
VOC	7.58	30.32	tpy	30.33	tpy	30.33	tpy
SO_2	1.99	7.96	tpy	7.96	tpy	7.96	tpy
PM_{10}	15.00	60.00	tpy	60.00	tpy	60.88	tpy

Emissions from Emergency Diesel Firewater Pump

Rated Horsepower	160	BHP
Testing duration	60	min/week
Yearly testing	52	week/year
Expected non-emergency usa	52	hr/yr

Diesel Fired	mission Fact	Emission Rate per Testing	Yearly Emission Rate
	g/HP/Hr	lb/hr	lb/yr
NO_x	3.90	1.38	71.54
CO	0.66	0.23	12.11
VOC (Total Hydrocarbons)	1.00	0.35	18.34
SO_x		2.26E-03	0.12
PM_{10}	0.15	0.05	2.75

Engine parameters

Flow Rate (acfm)	1235
Exhaust Temp (degrees F)	872
Stack Diameter (feet)	0.5052
Stack height (feet)	17 (13 ft building + 4 ft stack)

Data from Bibb
Sulfur content 15 ppm in fuel

Cooling Tower Drift Calculation

Cooling Tower			
	design circulating water rate	27,500	gallons/min
	cycles of concentration	3	
	TDS	1700	mg/liter
		14.19	lb/1000 gallons
	Drift Eliminator Control	0.000005	
	Operating hours per year	5000	
	Drift PM emissions	0.35	lb/hr total from all cells
		0.12	lb/hr from each cell
		0.88	**tpy**

Attachment B

Emission Reduction Certificates

Secured by Panoche Energy Center, LLC

Cert. No.	Holder	Type	1Q	2Q	3Q	4Q	Annual	Status/comments
Required		SOx	2.627	2.627	3.821	2.866	11.94	
N-74-5	J R Simplot Company	SOx	0.78	0.78	0.78	0.78	3.120	Agreement signed August 29, 2006
N-268-5	J R Simplot Company	SOx	26.765	24.655	0	72.808	124.228	Agreement signed August 29, 2006
Surplus		SOx					115.038	99.480 applied to PEC PM10
Required		PM_{10}	20.09	20.09	29.222	21.917	91.320	
S-2209-4	Complete Energy (LaPaloma)	PM_{10}	4.3705	3.7595	4.1065	4.2285	16.465	Agreement to be signed October 16, 2006.
S-2210-4	Complete Energy (LaPaloma)	PM_{10}	0.452	0.4615	0.4905	0.4805	1.8845	Agreement to be signed October 16, 2006.
S-2211-4	Complete Energy (LaPaloma)	PM_{10}	1.7935	1.9285	2.208	2.11	8.04	Agreement to be signed October 16, 2006.
S-2212-4	Complete Energy (LaPaloma)	PM_{10}	1.691	1.811	1.5865	1.9275	7.016	Agreement to be signed October 16, 2006.
S-2213-4	Complete Energy (LaPaloma)	PM_{10}	0	0.343	0.401	0.3615	1.1055	Agreement to be signed October 16, 2006.
S-2227-4	Complete Energy (LaPaloma)	PM_{10}	0	0.5295	0.529	0.4755	1.544	Agreement to be signed October 16, 2006.
N-268-5	J R Simplot Company	PM_{10}					55.265	99.48 tons SOx applied at 1.8SOx to1PM10 ratio.
Surplus		PM_{10}					0.00	
Required		VOC	10.035	10.035	14.105	10.95	45.125	
S-2331-1	Big West of CA	VOC	11.653	11.654	11.654	11.654	46.615	Agreement signed October 09, 2006.
Annual Surplus		VOC					01.615	
Required		NOx	31.987	31.987	46.526	34.895	145.400	
S-2214-2	Complete Energy (LaPaloma)	NOx	11.190	11.313	11.438	11.438	45.379	Agreement to be signed October 16, 2006.
S-2362-2	Panoche Energy Center, LLC	NOx	22.049	26.057	26.057	26.057	100.220	SJVAPCD issued Certificate on September 25, 2006
Surplus		NOx					9.5495	Surplus will be applied to Bullard Energy Center, LLC

Note: all ERC values in expressed in tons

Attachment C
Development of NOx/PM_{10} and SO_2/PM10 Inter-pollutant Offset Ratio for Fresno County

1.0 Introduction

The San Joaquin Valley Unified Air Pollution Control District is a PM_{10} non-attainment area with respect to both the federal and California ambient standards for this pollutant. The Panoche Energy Center proposed for Fresno County would result in PM_{10} emissions from various onsite stationary source units. Because the background concentrations already exceed the National and California ambient standards for this pollutant, such emissions increases in PM_{10} have the potential to exacerbate existing exceedances. Accordingly, SJVAPCD regulations require a project that will cause an increase in PM_{10} emissions to provide offsets in sufficient amounts to provide a net air quality benefit.

Reductions of SO_x and NO_x emissions can be used to offset the PM_{10} impact from a new source within the SJVAPCD, because sulfates and nitrates are precursors of particulate matter. In order to quantify the offset requirement when such interpollutant trading is used, the appropriate ratios between PM_{10} and SO_x and PM_{10} and NO_x must be calculated. According to SJVAPCD policy (Sweet, 2006), inter-pollutant trading ratios specific to the Panoche project area can be calculated using results of Chemical Mass Balance (CMB) modeling conducted by SJVAPCD staff as part of the District's 2003 PM_{10} Attainment Plan. As recently as the spring of 2006, URS was informed by SJVAPCD that the assumptions, monitoring data, emissions inventory data and calculation methods used in the Attainment Plan are sufficiently recent to be considered valid for the purpose of estimating current SO_x/PM_{10} and NO_x/PM_{10} interpollutant offset ratios.

2.0 CMB Modeling Results and Annual Roll Back Analysis

Receptor modeling using the chemical mass balance model was conducted by SJVAPCD for sites in the project area that currently do not comply with the federal PM_{10} air quality standards. This method uses chemical analysis of collected air monitoring samples and information about the chemical composition of contributing sources to evaluate the link between observed concentrations and contributing emission sources. The SJVAPCD used the results of its CMB analysis with a modified rollback approach to calculate the effects on design particulate values that would result from implementation of adopted and proposed control measures to reduce PM_{10} pollution and other predicted emission trends for the most recent PM_{10} Attainment Plan. The results can also be used to support calculation of interpollutant offset ratios, as described later. The data used for this purpose were taken from an Excel workbook titled N2-Annual Rollback Analysis which was provided by SJVAPCD. Tables 1-4 summarize the data from the N2 Rollback Analysis that are relevant to this application

Table 1 presents monthly and annual average CMB modeling results for Fresno County. This includes measured PM10 concentrations at the Fresno Drummond monitoring site

and model predicted contributions to these concentrations due to various source types. Table 2 shows the annual average CMB modeling results and design values for the SJVAPCD areas that are noncompliant with the PM_{10} standards from Table 1, including Fresno Drummond results. The design values were determined using EPA calculation methods (EPA 2004) and the air quality monitoring data collected in Fresno County. In Table 2, 'Sum of Species' represents the summation of the mass concentrations across all source categories, including 'Burning', 'Motor Vehicle', 'Tire/Brake', 'Sulfate', 'Nitrate', and 'Geological'. The value difference between 'Sum of Species' and 'Design Value' was left in the "unassigned" column.

The rollback analyses conducted by SJVAPCD used a speciation model with the CMB results. This modified rollback analysis showed not only the speciation, but also how the species were distributed and estimated source attributions for both primary and secondary pollutant species. The rollback analysis also considered other factors, including geological information, PM, VOC, and NO_x inventory totals, and other relevant information. Separate modeling was conducted in the rollback analysis for each county to account for conditions and characteristics that are unique to specific areas of the SJVAPCD. The rollback analysis for Fresno County is shown in the tab labeled "Fresno" within the Excel Workbook provided in Attachment 1 "N2-Annual Rollback Analysis".

The SJVAPCD rollback analysis was conducted as follows. Line 1 in Table 3 shows the concentration values influenced by the local area emissions. The 'Annual design value' equivalent to the chemistry of the CMB monthly analysis of the Fresno Drummond data in the Table 2 matches with the 'General Note' in Line 1 of Table 3. The mass concentrations of 'Geological', 'Mobile', 'Tire/Brake', and 'Unassigned' in Table 2 are equivalent to the corresponding attributes in line 1 of Table 3. The cells in Line 1 for vegetative burning and organic carbon represent 70% and 30% respectively of the value for 'Burning' in Table 2.

Line 2 of Table 3 shows concentration values for the natural and transport contributions for each attribute, which come from background concentration measurements. Line 3 is the 'net for rollback' concentrations, which means the differences in values between Line 1 and Line 2. The values of Line 3 are distributed to Line 4 through Line 7 based on the area of influence and the percentage distribution of PM10 source categories used by SJVAPCD. The attributes of 'Geological and Construction', 'Tire/Brake', and 'Unassigned' follow the corresponding percentages of PM_{10} distribution. The attributes of 'Mobile', 'Organic Carbon', 'Vegetation Burning', 'Ammonium Nitrate', and 'Ammonium Sulfate' follow the percent of $PM_{2.5}$ distribution. Lines 4 and 5 represent the local contribution of $PM_{2.5}$ minus PM_{10} and $PM_{2.5}$, respectively. Line 6 presents the sub-regional contribution, and Line 7 shows the regional contributions.

The most current emission inventory (lb/day) for PM_{10}, NO_x, total organic compounds (TOG) and SO_x for the Fresno-Madera area is provided in Table 4.

Values from Tables 3 and 4 were used to calculate the inter-pollutant trading ratio for Fresno County. The methods employed for these calculations are addressed in the next section.

Table 1 Monthly and Annual Average CMB results at the Fresno Drummond site for February to December 2000 plus the January 2001 Episode (all concentrations are in µg/m^3)

Fresno Drummond Monthly

SITE ID	DATE	CONC	UCONC	PCMASS	RSQ	CHISQ	Burning		Motor Vehicle		Tire/Brake		Sulfate		Nitrate		Geological	
							Mass	Unc	Mass	Unc	Mass	Unc	Mass	Unc	Mass	Unc	Mass	Unc
FSD	1/1/01	186	9.4	87.9	1.0	1.1	40.1	11.3	18.5	9.6	2.5	1.5	5.0	0.7	62.4	5.1	35.1	6.8
FSD	Feb	27.0	2.1	97.3	1.0	0.7	5.7	2.5	3.1	1.8	0.3	0.4	1.1	0.2	7.7	0.8	8.3	2.1
FSD	Mar	23.9	2.1	116.0	1.0	0.7	4.6	2.4	3.1	1.8	0.1	0.4	1.8	0.2	8.2	0.9	9.9	2.3
FSD	Apr	24.8	2.2	112.1	1.0	0.6	3.4	2.7	2.4	1.6	0.2	0.5	2.4	0.2	5.0	0.5	14.4	3.0
FSD	May**	20.0	2.1	99.5	1.0	0.6	0.345	0.329	2.1	1.4			2.327	0.226	2.4774	0.3211	12.6	1.7055
FSD	Jun*	34.1	2.5	105.8	1.0	1.0	1.9	0.4	3.8	2.3	0.0	0.6	4.2	0.4	3.6	0.4	22.5	3.8
FSD	Jul*	26.4	2.3	100.6	1.0	0.6	1.0	0.4	1.5	1.3			1.7	0.2	2.7	0.3	19.6	2.2
FSD	Aug*	38.2	2.5	90.2	0.9	2.7	3.8	0.7	0.9	1.5	1.4	0.9	2.0	0.3	3.3	0.4	23.1	4.3
FSD	Sep*	56.7	3.3	92.8	1.0	0.9	1.5	0.6	3.4	2.5	0.9	1.0	2.6	0.4	3.6	0.4	40.6	6.0
FSD	Oct*	50.7	3.4	93.5	1.0	0.5	1.8	0.4	4.5	2.6			2.2	0.3	8.4	0.8	30.6	3.3
FSD	Nov	40.5	2.6	95.7	1.0	0.4	11.9	3.3	4.5	2.7	0.4	0.4	2.1	0.2	13.1	1.2	6.8	1.8
FSD	Dec	65.8	3.9	89.7	1.0	0.8	13.7	4.3	7.3	3.8	0.8	0.6	3.2	0.3	23.4	2.0	10.6	2.6
Min		20.0	2.1	87.9	0.9	0.4	0.3	0.3	0.9	1.3	0.0	0.4	1.1	0.2	2.5	0.3	6.8	1.7
Avg		49.5	3.2	98.4	1.0	0.9	7.5	2.4	4.6	2.8	0.7	0.7	2.6	0.3	12.0	1.1	19.5	3.3
Max		186.0	9.4	116.0	1.0	2.7	40.1	11.3	18.5	9.6	2.5	1.5	5.0	0.7	62.4	5.1	40.6	6.8

Note:
CONC: concentration
UCONC: Uncertainty of concentration
PCMASS: Percent of mass
RSQ: R square
CHISQ: Chi square
Mass: concentration based on mass
UNC: Uncertainty of concentration based on mass

Table 2 Annual Average CMB results and Design Value for the Counties Noncompliant with the Standards (50) in San Joaquin Valley Unified Air Pollution Control District (All concentrations in µg/m^3)

SITE ID	CONC	UCONC	PCMASS	Design Value *	Sum of species	Burning		Motor Vehicle		Tire/Brake		Sulfate		Nitrate		Geological		Geological		Un-assigned
						Mass	UNC	Mass	UNC	Mass	UNC	Mass	UNC	Mass	UNC	Mass	UNC	Profile		
BGS	57.7	3.6	98.5	57.0	55.6	6.3	2.3	3.6	2.4	1.1	1.2	3.0	0.3	14.9	1.3	26.7	5.8	FDKERANN		1.4
FSD	**49.5**	**3.2**	**98.4**	**50.0**	**46.9**	**7.5**	**2.4**	**4.6**	**2.8**	**0.7**	**0.7**	**2.6**	**0.3**	**12.0**	**1.1**	**19.5**	**3.3**	**FDFSDANN**		**3.1**
HAN	51.5	3.3	104.1	53.0	52.9	6.6	2.0	4.0	2.3	0.5	0.7	3.0	0.3	15.7	1.4	23.2	4.2	FDHANANN		0.1
VCS	52.5	3.3	99.6	54.0	51.8	6.7	2.5	4.0	2.5	0.5	1.0	3.1	0.3	15.9	1.5	21.7	3.8	FDVCSANN		2.2

Note:
* All Design Values are equal to or exceed the California 24-Hour Standard (50 µg/m^3)
BGS: Bakersfield Golden State for Kern County
FSD: Fresno Drummond for Fresno County
HAN: Hanford for Kings County
VCS: Visalia Church Street for Tulare County
Unassigned: Mass based concentration that CMB model did not assign to attribute.

Table 3
SJVAPCD N2 Annual Rollback Analysis (Concentrations on Lines 1 through 7 are in µg/m^3)

Fresno - Drummond, Annual, Design value = 50 µg/m3	General Note	Geologic and Construction	Mobile Exhaust	Tire and Brake Wear	Organic Carbon	Vegetative Burning	Ammonium Nitrate including associated water	Ammonium Sulfate	Marine	Unassigned
Line1 Source Contribution from Analysis	From CMB monthly analysis Feb 2000 to Dec 2000, adding January 2001 episode for chemistry equivalent to annual design value	From CMB	From CMB	From CMB	Estimated portion of mass included in Vegetative Burning =30%	From CMB minus estimated Organic Carbon from other sources	From CMB	From CMB	From CMB, if present	Unaccounted mass from CMB, if any.
LINE 1	**50.00**	**19.50**	**4.60**	**0.70**	**2.25**	**5.25**	**12.00**	**2.60**	**0.00**	**3.1**
Line2 Natural and Transport Contribution, see "Background" sheet	Portion not included in rollback analysis, removed prior to rollback as not subject to local control, added back to projected future concentrations	See background sheet for numerical estimate and episode adjustment. Removed prior to rollback as not subject to local control, added back to projected future concentrations	0, no natural background, transport estimated at 0	0, no natural background, transport estimated at 0	See background sheet for numerical estimate and episode adjustment. Removed prior to rollback as not subject to local control, added back to projected future concentrations. Includes biogenic emissions. = 20%	See background sheet for numerical estimate and episode adjustment. Removed prior to rollback as not subject to local control, added back to projected future concentrations. Includes wildfires and biogenic. =20% + 10%	See background sheet for numerical estimate and episode adjustment. Removed prior to rollback as not subject to local control, added back to projected future concentrations	See background sheet for numerical estimate and episode adjustment. Removed prior to rollback as not subject to local control, added back to projected future concentrations	100% because marine salts are a natural emission	0, background estimate at maximum, no additional background estimate for unexplained mass
LINE 2	**8.25**	**4.0**	**0.0**	**0.0**	**0.7**	**1.6**	**1.0**	**1.0**		
Line 3 Net for Rollback	Net for Rollback, default percentages adjustable for episode characteristics, applicable to all columns except						Net for non-linear rollback, default percentages adjustable for episode characteristics		Removed entirely from rollback, added back to result	

Fresno - Drummond, Annual, Design value = 50 µg/m3	General Note	Geologic and Construction	Mobile Exhaust	Tire and Brake Wear	Organic Carbon	Vegetative Burning	Ammonium Nitrate including associated water	Ammonium Sulfate	Marine	Unassigned
	as indicated.									
LINE 3	**41.75**	**15.5**	**4.6**	**0.7**	**1.6**	**3.7**	**11.0**	**1.6**	**0.0**	**3.1**
Line4 Local Contribution PM2.5-PM10 Area of Influence	Source contribution from smallest area of influence, representative of large particle primary source area, includes all PM size emissions in the area - Rolled back against local area of influence emission estimates	70%PM10 50%PM2.5 of net	70%PM10 50%PM2.5 of net	70%PM10 50%PM2.5 of net	70%PM10 50%PM2.5 of net	70%PM10 50%PM2.5 of net	70%PM10 50%PM2.5 of net, non-linear rollback	70%PM10 50%PM2.5 of net		70%PM10 50%PM2.5 of net
LINE 4	**24.74**	**10.9**	**2.3**	**0.5**	**0.8**	**1.8**	**5.5**	**0.8**		**2.2**
Line5 Local Contribution Area of Influence of PM2.5	Rolled back against local PM2.5 area of influence emission estimates - episode specific adjustments based on meteorology and episode duration	15%PM10 30%PM2.5	15%PM10 30%PM2.5	15%PM10 30%PM2.5	15%PM10 30%PM2.5	15%PM10 30%PM2.5	15%PM10 30%PM2.5 non-linear rollback	15%PM10 30%PM2.5		15%PM10 30%PM2.5
LINE 5	**9.63**	**2.3**	**1.4**	**0.1**	**0.47**	**1.1**	**3.3**	**0.5**		**0.5**
Line6 Sub regional Contribution	Rolled back against specified County(ies) emission estimates - episode specific	10%PM10 15%PM2.5	10%PM10 15%PM2.5	10%PM10 15%PM2.5	10%PM10 15%PM2.5	10%PM10 15%PM2.5	10%PM10 15%PM2.5 non-linear rollback	10%PM10 15%PM2.5		10%PM10 15%PM2.5

Fresno - Drummond, Annual, Design value = 50 µg/m3	General Note	Geologic and Construction	Mobile Exhaust	Tire and Brake Wear	Organic Carbon	Vegetative Burning	Ammonium Nitrate including associated water	Ammonium Sulfate	Marine	Unassigned
	adjustments based on meteorology and episode duration									
LINE 6 Line7 Regional Contribution	5.30 Rolled back against Valley-wide emission estimates - episode specific adjustments based on meteorology and episode duration	1.6 5%PM10 5%PM2.5	0.7 5%PM10 5%PM2.5	0.1 5%PM10 5%PM2.5	0.24 5%PM10 5%PM2.5	0.6 5%PM10 5%PM2.5	1.65 5%PM10 5%PM2.5 non-linear rollback	0.24 5%PM10 5%PM2.5		0.3 5%PM10 5%PM2.5
LINE 7 Associated Emissions Categories	2.09 Based upon appropriate seasonal or annual inventory	0.8 PM10 paved roads+ PM10 unpaved roads+ PM10 off road mobile+ PM10 farm operations+ PM10 construction+ PM10 windblown	0.2 PM10, TOG & CO onroad mobile+ PM10, TOG & CO 860 offroad equipment PM10, TOG & CO 870 farm equipment CO presumed to add minimal mass	0.0 Tire and brake wear as predicted by EMFAC2002	0.08 Total TOG minus motor vehicle, OC may also include a small portion of otherwise unassigned elemental carbon PM10 & CO Area, Stationary CO presumed to add minimal mass	0.2 PM10 & CO residential burning PM10 & CO waste burning and disposal PM10 cooking PM10 & CO fires CO presumed to add minimal mass	0.55 Total E.I. NOx (+ bacterial soil NOx estimate removed as natural background)	0.08 Total SOx	None, natural emission from the ocean, bay and delta waters	0.2 Total PM10

Table 4 Emission Inventory for Year 1999 through Current Year (valid for this project)- All emissions in tons per day

Emissions Inventory	Area of Influence	Geologic and Construction	Mobile Exhaust	Tire and Brake Wear	Organic Carbon	Vegetative Burning	Ammonium Nitrate including associated water	Ammonium Sulfate	Marine	Unassigned
PM10	Fresno	74.4504	4.1236	0.511	5.6266	10.4843				39.92145356
NOx	Fresno						174.7763			
TOG	Fresno		58.2653		396.7168					
SOx	Fresno							9.0772		

3.0 Interpollutant Trading Ratio

The SJVAPCD (Sweet, 2005) provided the interpollutant trading calculation method, which is presented in Tables 5, 6, and 7. Summing 'organic carbon' and 'vegetation burning' from Line 1 in Table 3 gave the value of 'Vegetative Burning Total' in Table 5. 'Industry Component' and 'Regional Background' were calculated as 30% and 20% of the'Vegetative Burning Total', respectively. The value for 'Regional Background' was subtracted from the 'Industry Component' to obtain the 'Industry minus Background' value. The value for 'County Contribution' was estimated to be 50% of the value of 'Industry minus Background'. The value for 'Organic Carbon PM_{10} Inventory-Fresno County' was obtained from the emission inventory shown in Table 4. The value for 'County Contribution' divided by the value of 'Organic Carbon PM_{10} Inventory' gave the 'County Impact' in units of $\mu g/m^3$ per ton.

The values of 'Ammonium Sulfate' and 'Regional Background' in Table 6 were obtained from the values of 'Ammonium Sulfate' in Lines 1 and 2 in Table 4, respectively. The value of 'Ammonium Sulfate' was reduced by the value of 'Regional Background' to obtain the entry labeled 'Ammonium Sulfate minus Background'. The value for 'County Contribution' was also determined as 50% of the value of 'Ammonia Sulfate minus Background'. The value of 'SO_x Inventory-Fresno County' was obtained from the emission inventory shown in Table 4. The value of 'County Contribution' divided by the value of 'SO_x Inventory' gave the 'County Impact' in units of $\mu g/m^3$ per ton.

The inter-pollutant trading ratio of SO_2 to PM_{10} was calculated as the ratio of the 'County Impact' of PM_{10} to the 'County Impact' of SO_x. The ratio is 1.8 (tons of SO_2 to equal the effect of 1 ton of PM_{10} reduction). Likewise, the interpollutant trading ratio of NO_2 to PM_{10} was calculated in Table 7 as a ratio of the 'County Impact' of PM_{10} to the 'County Impact' of NO_x. The resulting ratio is 3.0 (tons of NO_2 to equal the effect of reducing 1 ton of PM_{10}).

Table 5 PM_{10} County Impact

PM_{10}	Note	Units	Estimate	Uncertainty
"Vegetative Burning" Total	1	$\mu g/m^3$	7.50	2.43
Industry Component (30%)	2	$\mu g/m^3$	2.25	
Regional Background (20%)	3	$\mu g/m^3$	0.45	
Industry minus Background		$\mu g/m^3$	1.80	
County Contribution	4	$\mu g/m^3$	0.90	
Organic Carbon PM_{10} Inventory - Fresno County	5	ton/day	5.63	
County Impact		$\mu g/m^3$ per ton	0.16	0.21

Table 6 SO_x County Impact and Inter-pollutant trading ratio of SO_x and PM_{10}

Sulfate	Note	Units	Estimate	Uncertainty
Ammonia Sulfate	6	$\mu g/m^3$	2.60	0.29
Regional Background	7	$\mu g/m^3$	1.00	
Ammonium Sulfate minus Background		$\mu g/m^3$	1.60	
County Contribution	8	$\mu g/m^3$	0.80	
SO_x Inventory - Fresno County	9	ton/day	9.08	
County Impact		$\mu g/m^3$ per ton	0.09	0.10
Tons of SO_x to Equal Effect of 1 ton PM_{10} Reduction	10		**1.8**	2.2

Table 7 NOx County Impact and Inter-pollutant trading ratio of NO_x and PM_{10}

Nitrate	Note	Units	Estimate	Uncertainty
Ammonium Nitrate	11	$\mu g/m^3$	12.00	0.29
Regional Background	12	$\mu g/m^3$	1.00	
Ammonium Nitrate minus Background		$\mu g/m^3$	11.00	
County Contribution	13	$\mu g/m^3$	5.50	
NOx Inventory - Fresno	14	ton/day	174.7763	
County Impact		$\mu g/m^3$ per ton	0.03	0.03
Tons of NO_x to Equal Effect of 1 ton PM_{10} Reduction	15		**3.0**	4.0

Note:
1. Per SJVUAPCD and CARB, PM_{10} emissions from stationary industrial combustion sources are included in the Vegetative Burning category from Chemical Mass Balance modeling performed for the SJVUAPCD 2003 PM_{10} Attainment Plan (Fresno-Drummond monitoring station).
2. Per SJVUAPCD, 30% of this category is attributed to stationary industrial combustion sources.
3. Per SJVUAPCD, regional background is estimated to be 20% of net concentration after previous adjustment to Vegetative Burning category.
4. Contribution from sources within Fresno County is estimated to be 50% of net concentration after previous adjustments to Vegetative Burning category.
5. Organic carbon PM_{10} inventory for Fresno County that contributes to this monitoring location; from SIP inventory with updates and adjustments based on Central California Ozone Study (CCOS) study.

6. Ammonium sulfate category from Chemical Mass Balance modeling performed for the SJVUAPCD 2003 PM_{10} Attainment Plan (Fresno-Drummond monitoring station).
7. Per SJVUAPCD, regional background of ammonium sulfate is estimated to be 1 mg/m^3.
8. Contribution from sources within Fresno is estimated to be 50% of net concentration after previous adjustment to Vegetative Burning category.
9. SO_x inventory for Fresno that contributes to this monitoring location; from SIP inventory with updates and adjustments based on CCOS study.
10. PM_{10} County Impact divided by Ammonium Sulfate County Impact.
11. Ammonium nitrate category from Chemical Mass Balance modeling performed for the SJVUAPCD 2003 PM_{10} Attainment Plan (Fresno - Drummond monitoring station).
12. Per SJVUAPCD, regional background of ammonium nitrate is estimated to be 1 mg/m^3.
13. Contribution from sources within Fresno County is estimated to be 50% of net concentration after previous adjustment to Vegetative Burning category.
14. NO_x inventory for Fresno County that contributes to this monitoring location; from SIP inventory with updates and adjustments based on Central California Ozone Study (CCOS) study.
15. PM_{10} County Impact divided by Ammonium Nitrate County Impact.

4.0 Reference

1) EPA-CMB8.2 Users Manual, December, 2004
2) San Joaquin Valley Air Pollution Control District State Implementation Plan PM10 Modeling Protocol (SJVAPCD, 2005)
3) Attachment 6 and calculation method obtained from SJVAPCD (James Sweet, james.sweet@valleyair.org, 559-230-5810)

Attachment 4

Gmail -talk BETA

David Jenkins <davdjenk@gmail.com>

RE: Starwood Proposed Fuel Sulfur Content and Testing

James Harader <James.Harader@valleyair.org> **Fri, Dec 15, 2006 at 8:52 AM**
To: "John_Lague@URSCorp.com" <John_Lague@urscorp.com>
Cc: Dustin Brown <Dustin.Brown@valleyair.org>, Stanley Tom <stanley.Tom@valleyair.org>, Errol Villegas <errol.villegas@valleyair.org>, "davdjenk@gmail.com" <davdjenk@gmail.com>, "Maggie_Fitzgerald@urscorp.com" <Maggie_Fitzgerald@urscorp.com>

John,

Sorry we haven't included you yet in the discussion regarding the fuel sulfur content of NG, which affects Bullard, Panoche, and Starwood. I understand that Dustin Brown recently brought some of the details to your attention. I think I can shed some light on the fuel sulfur content and how the District handles this in our evaluations.

To be conservative, the District typically assumes the worst case sulfur fuel content for all of our calculations. Therefore, our evaluations are typically based on a fuel sulfur content of 0.75 grains/scf or 1 grain/scf depending on BACT. This results in inflated annual SOx emission estimates, when you consider that PG&E's published annual average fuel sulfur content for their pipeline gas is much less than 0.75 grains/scf. My understanding is that the CEC requires you to offset SOx emissions and their regulations (or CEQA?) allow them to use the annual average sulfur fuel content. This leads to a relatively large discrepancy between our emission calculations and CEC's determination for SOx offsets.

Will Walters contacted myself to see if there was any way the District could use the annual average fuel sulfur content to calculate emissions in our evaluation. This way our numbers are consistent with CEC's. At this point in time, it appears that the District would only consider an annual average fuel sulfur content if site-specific fuel sulfur content testing was placed on the turbine permit. For a similar project, EPA has very recently stated that if we use an annual average fuel sulfur content on the permit, testing of fuel sulfur content would have to be at least monthly and site specific. Otherwise, they will most likely comment during the public notice period. Furthermore, I'm not entirely sure whether our upper management would buy off on limiting the annual average fuel sulfur content.

I contacted Will Walters on Wednesday, and what I took out of our conversation is that if the District uses 0.75 or 1.0 grains/SCF in our evaluation, the CEC doesn't necessarily have to use that for their offset determination for SOx. This is provided our emission estimates don't result in SOx emissions triggering offsets under our regulations. In other words, the CEC's offset determination is independent from ours.

In all likelihood, we will use the worst case fuel sulfur content for our analysis, while the CEC will continue to use the average fuel sulfur content for their offset analysis. Another option, is to perform periodic testing (most likely monthly) to confirm the average annual fuel sulfur content, if ourupper management would approve of that type of proposal. I encourage you to contact the CEC directly and see what their position on the fuel sulfur content is, and how it would affect SOx offsets if we use the worst case fuel sulfur content in our analysis.

If you have further questions or comments on the fuel sulfur content, feel free to give me a call at (559) 230-5887.

I also want to inform you that the final review for Panoche Energy Center has been re-assigned for final review to Stanley Tom, one of our senior engineers.

Thanks,

James Harader
Air Quality Engineer II
San Joaquin Valley APCD
(559) 230-5887

-----Original Message-----
From: Dustin Brown
Sent: Wednesday, December 13, 2006 11:34 AM
To: James Harader
Subject: FW: Starwood Proposed Fuel Sulfur Content and Testing

-----Original Message-----
From: John_Lague@URSCorp.com [mailto:John_Lague@URSCorp.com]
Sent: Wednesday, December 13, 2006 11:12 AM
To: Dustin.Brown@valleyair.org
Cc: rweiss@houston.rr.com; Ron.Watkins@calpeak.com; David_Marx@URSCorp.com; Angela_Leiba@URSCorp.com; Thomas_Carr@URSCorp.com; David A. Tyburski
Subject: FW: Starwood Proposed Fuel Sulfur Content and Testing

Dustin

As shown by the attached string of emails, we developed the sulfur contents for the Panoche Energy Center application (right next to the Midway site) based on looking at the pipeline quality natural gas characteristics PG&E put on their webpage and some subsequent discussions with Will Walters, the CEC air quality consultant for that job (and probably for Midway too). James Harader, the PEC permit engineer has not indicated that he has a problem with these sulfur levels, so I was surprised by your comment that we need to use a higher value for this project, which uses the same gas supply. Are you sure about this?

Thanks very much and best regards - jsl

John Lague
Senior Air Quality Consultant
URS Corporation
1615 Murray Canyon Road, Suite 1000
San Diego, California 92108
Phone: (619) 294-9400
Fax: (619) 293-7920

----- Forwarded by John Lague/SanDiego/URSCorp on 12/13/2006 10:55 AM -----

"Will Walters" <WWalters@aspeneg .com>	To <John_Lague@URSCorp.com>
08/11/2006 10:15 AM	cc "'Matthew Layton'" <Mlayton@energy.state.ca.us>, <Cindy_Poire@URSCorp.com>
Please respond to <WWalters@aspeneg .com>	Subject FW: Panoche Gas Composition - File: 012A

John,

Thank you, this supplemental filing provides the information needed for data adequacy. I will also like to know if it is included in a named submittal package (like AFC Supplement A, or some such name) and on what date it is officially submitted to dockets so that I can properly reference it in the DA form. I think that the Sulfur content information provided confirms that a 0.32 grain/100 scf value is a reasonably conservative value for determination of annual SOx emissions.

We have until Tuesday to receive the ERC information for its inclusion, any later and I cannot guarantee it will be included. As I mentioned over the phone, the District will try to complete their permit application completeness review within two weeks but they have until September 9th by rule.

Will Walters, Aspen
(818) 597-3407 ext. 345

From: John_Lague@URSCorp.com [mailto:John_Lague@URSCorp.com]
Sent: Friday, August 11, 2006 6:13 AM

To: WWalters@aspeneg.com
Cc: Cindy_Poire@URSCorp.com
Subject: Fw: Panoche Gas Composition - File: 012A

Hi, Will

See attachments provided in response to your request for a gas analysis. I will try to contact the client today about the additional detail on available ERCs you were asking about.

Cindy: I guess this needs to be docketed as well.

Regards - jsl

John Lague
Senior Air Quality Consultant
URS Corporation
1615 Murray Canyon Road, Suite 1000
San Diego, California 92108
Phone: (619) 294-9400
Fax: (619) 293-7920

-----Forwarded by John Lague/SanDiego/URSCorp on 08/11/2006 06:12AM -----

To: "'John_Lague@URSCorp.com'" <John_Lague@URSCorp.com>
From: "Brown, Robert E." <rebrown@bibb.com>
Date: 08/11/2006 05:49AM
cc: allanori@comcast.net, Cindy_Poire@URSCorp.com, dale@dgpower.com, gchandler@mstar2.net, "'Jennifer_Wu@URSCorp.com'" <Jennifer_Wu@URSCorp.com>, "'Howard, Milton'" <Milton.Howard@cinergy.com>, "'davdjenk@gmail.com'" <davdjenk@gmail.com>, "'mpk.nextgen@gmail.com'" <mpk.nextgen@gmail.com>, "Garrett, Stephen M." <SMGarrett@bibb.com>, "Swofford, Michael J." <MJSWOFFORD@bibb.com>, Duke - Panoche Project <duke-panoche@bibb.com>
Subject: Panoche Gas Composition - File: 012A

John,

Attached are two documents. One is the expected gas composition, which shows zero sulfur. The other is from the PG&E web site about the sulfur content of the gas in their pipe lines.

Bob

-----Original Message-----
From: John_Lague@URSCorp.com [mailto:John_Lague@URSCorp.com]
Sent: Thursday, August 10, 2006 8:46 PM
To: Brown, Robert E.
Cc: allanori@comcast.net; Cindy_Poire@urscorp.com; dale@dgpower.com;'Jenkins, Dave'; Duke - Panoche Project; gchandler@mstar2.net;'Jennifer_Wu@URSCorp.com'; 'King, Michael (Cinergy Solutions)'; 'Howard,Milton'; Garrett, Stephen M.;

'Tom.McNay@Cinergy.COM'; 'Zwinklis,Victor'

Subject: Re: Panoche AFC - Revised Water Balances - File: 012E

Bob

Will Walters, who is doing the CEC review of our Panoche AFC air quality section is asking me for a fuel gas analysis. I looked through the Bibb web site and could not find one. I do have emails from you that reference a fuel analysis that shows no sulfur in the gas, but I don't think I ever actually saw this. Will is saying this is a data adequacy item that he would like to check off rather than make it an issue so if you could send me the analysis you have,that will save having it show up as a missing item.

Thanks - jsl

John Lague
Senior Air Quality Consultant
URS Corporation
1615 Murray Canyon Road, Suite 1000
San Diego, California 92108
Phone: (619) 294-9400
Fax: (619) 293-7920

(See attached file: Panoche Gas Analysis.pdf)(See attached file: Panoche Gas Sulfur Content.pdf)

Attachment 5

Gmail -talk BETA

David Jenkins <davdjenk@gmail.com>

Cumulative Modeling Analysis

David Jenkins <davdjenk@gmail.com> **Tue, Dec 19, 2006 at 10:55 AM**
To: James Harader <james.harader@valleyair.org>, Errol Villegas <errol.villegas@valleyair.org>
Cc: "John_Lague@urscorp.com" <john_lague@urscorp.com>

Erroll & James,

As part of Panoche's CEC data request, PEC needs to provide a "cumulative modeling analysis" for all existing and planned facilities within a 6-mile radius of our project site. (As far as I know, this would include the two nearby power plants and the proposed Starwood plant.) We would like to add this analysis to our formal data request submittal to the CEC by January 9, 2007. If possible, could you provide me (or John Lague) with this analysis by January 2, 2007 so URS will have time to package it with this other information? Thanks,

Dave

Cell (317) 431-1004
davdjenk@gmail.com

Technical Area: Air Quality

Data Request 4 Rev: Please update as necessary any modeling files with emissions affected by these proposed changes; combine the receptors and multiple year meteorological files to reduce the number of modeling runs by a factor of ten.

Response:

Revised dispersion model input/output files reflecting the changes to operational project emissions discussed in these data request responses are provided electronically on a DVD accompanying these data request responses. The results of the revised modeling are presented below in Revised Table 5.2-18B.

Note: Modeling for the worst-case 1-hour NO2 scenario assumed concurrent commissioning emissions for all four turbines. When added to a conservative background concentration based on the highest monitored value, this result exceeded the California 1-hour standard for NO2 of 470 µg/m3. For this reason, PEC will accept a condition not to conduct commissioning tests on more than 2 turbines in the same hour. Based on this commitment, and because no other facility sources would be operating during commissioning, the maximum predicted concentration due to this activity has been divided by 2 in Table 5.2-18B below, which results in compliance with the standard.

Table 5.2-18B (Revised)
Maximum Modeled Criteria Pollutant Impacts due to Operational PEC Emissions

Pollutant	Averaging Period	Maximum Modeled Impact (µg/m³)	PSD Significant Impact Level[1] (µg/m³)	Background[2] (µg/m³)	Maximum Total Predicted Concentration (µg/m³)	Most Stringent AAQS (µg/m³)	UTM Coordinates	
							East (m)	North (m)
CO	1 hour[1]	346.26	2,000	7,705	8,051.3	23,000	710,920	4,053,581
	8 hour[2]	191.49	500	5,156	5,347.5	10,000	714,670	4,049,781
NO_2	1 hour[1]	171.6	NA	169.2	340.8	470	710,895	4,053,606
	1 hour (normal ops)	136.02	NA	169.2	305.2	470	715,985	4,058,633
	Annual[3]	0.12	1	42.0	42.12	100	707,770	4,056,655
PM_{10}	24 hour[4]	2.83	5	193.0[4]	195.83	50	708,095	4,057,055
	Annual[3]	0.52	1	43.0[4]	43.52	20	716,126	4,058,637
$PM_{2.5}$	24 hour[4,5]	4.47	NA	110.0	114.47	65	716,126	4,058,637
	Annual[3,5]	0.17	NA	21.6	21.77	12	716,126	4,058,637
SO_2	1 hour[1]	2.10	NA	23.6	25.70	655	710,895	4,053,606
	3 hour[6]	1.57	25	15.6	17.17	1,300	711,095	4,053,606
	24 hour[4]	0.57	5	10.5	11.07	105	707,695	4,056,830
	Annual[3]	0.02	1	5.3	5.32	80	707,770	4,056,655

Notes:

µg/m³ = micrograms per cubic meter
CO = carbon monoxide
ISCST3 = USEPA Industrial Source Complex model, Version 02035
m = meters
NA = Not applicable
NAAQS = Most stringent ambient air quality standard for the averaging period
NO_2 = nitrogen dioxide
OLM = ozone limiting method
PM_{10} = particulate matter less than or equal to 10 microns in diameter
$PM_{2.5}$ = particulate matter less than or equal to 2.5 microns in diameter. All PM emissions during operation assumed to be $PM_{2.5}$
PSD = Prevention of Significant Deterioration
SO_2 = sulfur dioxide
UTM = Universal Transverse Mercator

[1] Maximum hourly impact based on four turbines operating under commissioning conditions and one hour of diesel fire pump operation. Since this resulted in a predicted total NO_2 concentration above the California ambient standard, the predicted maximum impact from commissioning emissions of NO_x was divided by a factor of two to represent the impacts of only two turbines conducting commissioning tests in the same hour. PEC will accept a condition to this effect.

[2] Maximum 8-hour impact based on four turbines operating for 8 hours under commissioning conditions and one hour of diesel fire pump operation.

[3] Annual impact based on 4,734 hours of normal operation, 20 maintenance hours, 365 startups, and 365 shutdowns for all four turbines (total of 5,000 hours), 5,000 hours of cooling tower operation, and 52 hours of diesel fire pump engine operation.

[4] Maximum 24-hour impact based on three startups, three shutdowns and remainder of period at normal operations for four turbines and 1 hour of fire pump engine.

[5] All operational Project equipment PM_{10} emissions assumed to be $PM_{2.5}$.

[6] Maximum 3-hour impact based on 3 hours of normal operation for four turbines and one hour of fire pump engine.

[7] PM10 and PM2.5 monitored concentrations used for background exceed standards.

TECHNICAL AREA: AIR QUALITY

Data Request 5 Rev: The ammonia slip emissions estimate provided in Appendix I provides emissions based on both 10 ppm, identified as T-BACT and 6 ppm, identified as BACT. However, Section 5.2 of the AFC indicates ammonia slip BACT to be 10 ppm. Please confirm which level is proposed as BACT, and if 10 ppm is proposed please explain why Appendix I provides calculations for 6 ppm slip.

Response:

The reference in Appendix I to a 6 ppmvd stack concentration of ammonia slip was incorrect. The proposed value is 10 ppmvd @15% O2.

TECHNICAL AREA: AIR QUALITY

Data Request 6 Rev: Please explain why the startup and shutdown emission levels indicated in Table 5.2-13 are significantly different than the startup/shutdown estimates provided for the Walnut Creek Energy Park (05-AFC-2), Sun Valley Energy Project (05-AFC-3), and Highgrove (06-AFC-2) that also will use the GE LMS100 turbines.

Response:

The turbine startup and shutdown data provided by General Electric and the breakdown of this information by Bibb Engineering to represent cold start emissions are included in the response to Data Request 2 in the revised AFC Appendix I Attachment C spreadsheets, which is the revised Excel workbook for operational emissions calculations that is referenced in Response No. 2. Since the original data were developed for a fuel gas sulfur content of 0.5 grain per 100 dry standard cubic feet, the emissions information in Revised Table 5.2-13 has been adjusted to reflect a sulfur content of 0.75 grains per 100 cubic feet (see Response No. 4). We have not received any information from General Electric that would suggest these numbers are not reasonably representative for cold starts.

TECHNICAL AREA: AIR QUALITY

Data Request 7 Rev: For unsteady state operations, Table 5.2-13 in the AFC shows an initial startup period of 10 minutes, an additional warm-up period after initial startup of 20 minutes needed to completely warm-up the SCR system, and a 10.5 minute shutdown. The delineation of these unsteady state operations and the emissions assumed for these unsteady state operations are considerably different than those for the Walnut Creek Energy Park (05-AFC-2), Sun Valley Energy Project (05-AFC-3), and Highgrove (06-AFC-2) that also will use the GE LMS100 turbines. Please explain why the warm-up and the shutdown emission rates are higher for NOx, CO, and SO2 and lower for VOC and PM10 than the startup emission rates. The difference in the emission rate direction of the SO2 and PM10 emission rates, which are both generally based on fuel flow, are of particular interest.

Response:

Corrected startup and shutdown LMS100 turbine emissions are presented in Revised Table 5.2-13 which is provide with the response to Data Request No. 2. These data were based on data provided by General Electric and are similar to the values shown in the AFC. However, the SO2 emissions have been revised to reflect a worst-case fuel gas sulfur content required by SJVAPCD of 0.75 grains per 100 dry standard cubic feet, which is higher than the value assumed in the AFC. Similarly, the startup and shutdown PM10 emissions have been adjusted due to General Electric's agreement after AFC submittal to guarantee a base full-load PM10 emission rate for the LMS100 of 6 rather than 11 lb/hour/turbine. We do not know why these vendor-provided data differ from those of other recent LMS100 projects.

TECHNICAL AREA: AIR QUALITY

Data Request 8 Rev: Please provide the expected exhaust parameters (temperature and velocity) for the six specific initial commissioning tests identified on page 5.2-19 of the AFC.

Response:

Information provided by the turbine manufacturer (General Electric) on commissioning stack parameters and emissions for each LMS100 CTG is provided in the table below. The revised modeling conducted for the PEC operational emissions in response to these CEC data requests used a conservative combination of the stack parameters shown here. Note that the SO2 emissions have been revised to reflect a worst-case fuel gas sulfur content required by SJVAPCD of 0.75 grains per 100 dry standard cubic feet, which is higher than the value assumed in the AFC. Similarly, the commissioning PM10 emissions have been adjusted due to General Electric's agreement after AFC submittal to guarantee a base full-load PM10 emission rate for the LMS100 of 6 rather than 11 lb/hour/turbine.

Operating and stack parameter for LMS100 Commissioning

Description	Power Level	Corrected Operating Hours	Estimated Fuel Rate (MMBtu/hr)	Total Estimated Emission per Event				Exhaust Temperature (deg F)	Exhaust Flow (ACFM)
				NO_X (lbs)	CO (lbs)	VOC (lbs)	PM_{10} (lbs)		
*** First fire the unit & then shutdown to check for leaks, etc**									
	Core/Sync Idle	16	73.5	178	727	18.5	96	859	163836
*** Synch & Check E-stop**									
	Sync Idle	12	73.5	133.5	545.2	13.9	72	859	163836
*** Additional AVR Commissioning**									
	5%	12	92.8	251	363.2	8.7	72	864	226630
*** Break-in Run**									
	5%	8	92.8	167.3	242.1	5.8	48	864	226630
*** Dynamic Commissioning of AVR & Commission Water**									
Load Step 1	10.00%	4	166.1	66.8	277	21.0	24	868	289675
Load Step 2	20.00%	4	245.5	98.6	181	10.4	24	827	380155
Load Step 3	30.00%	4	319.3	128	181	10.6	24	806	456411
Load Step 4	40.00%	4	389.1	156	160	10.7	24	785	524273
Load Step 5	50.00%	4	457.4	184	132	11.3	24	770	588755
Load Step 6	60.00%	4	524.6	211	180	13.5	24	760	648646
Load Step 7	70.00%	4	590.8	237	247	16.3	24	752	706812
Load Step 8	80.00%	4	658.5	265	349	20.7	24	752	761888
Load Step 9	90.00%	4	727.9	292	516	29.5	24	758	817320
Load Step 10	100.00%	4	798.1	321	789	47.9	24	767	873543
*** Base load AVR Commissioning**									
	100%	16	798.1	2689	4890	239.0	96	767	873543

TECHNICAL AREA: AIR QUALITY

Data Request 9 Rev: The operating cases modeled are conservative, but seem unrealistically conservative. Please provide brief but specific explanations of the source of the emission input assumptions and the stack parameter (temperature and velocity) input assumptions for each of the pollutant/averaging time modeling scenarios presented. Also, please identify whether any multipliers were used to account for the maximum proposed annual operations limit of 5,000 hours.

Response:

The procedure followed to determine emission rates and stack parameters for each pollutant and averaging time combination was described in the AFC.

- Screening dispersion modeling was conducted using unit emission rates for the turbines, since these are by far the most significant operational emission sources associated with the project. These simulations were performed using five years of meteorological input data for each of 12 different combinations of turbine operating load and ambient temperatures. The screening results (concentrations per unit emission rate) were then scaled by the actual emission rates for each pollutant to determine the stack parameters corresponding to the highest off-site concentrations for each pollutant and averaging time. In the subsequent refined model simulations, the turbine stack parameters identified in the screening runs were chosen for the appropriate averaging time. The temperatures and flow rates for each of the 12 operating conditions considered in the screening analysis are presented in the spreadsheets included in the response to Data Request 2 in the revised AFC Appendix I Attachment C spreadsheets.

- The combination of emission events that would produce the highest mass emissions that would be reasonably expected to occur over the averaging times of concern (1, 3, 8, and 24 hours and annual) were determined (see Revised Table 5.2-14 in Response No. 2). Then the stack parameters found to result in the maximum offsite impacts for that pollutant and averaging time in the screening modeling described above were matched with the maximum emissions. When the refined modeling was conducted with the five-year meteorological input data, the worst-case emissions and stack parameters were forced to occur with the worst-case dispersion conditions for each averaging time of concern. The use of this very conservative methodology is designed to ensure that compliance with the applicable ambient air quality standards will be ensure no matter what operating conditions the new power plant may face.

TECHNICAL AREA: AIR QUALITY

Data Request 10 Rev: Please provide a tabulated list showing quarterly emission and emission offset accounting indicating the proposed quantity used quarterly from each ERC source to fully offset the project's emissions. Please show the current updated ERC certificate number and former certificate number for all certificates that have been recently split and/or re-issued in the name of the project.

Response:

See tables below showing emissions and offset requirements by quarter, as well as the ERC credits that have been secured as of the date of these data request responses. Note that use of SO2 ERCs to offset project PM10 emissions at an interpollutant ratio of 1.8 to 1 is assumed.

DR No. 10

PANOCHE ENERGY CENTER, LLC - *EMISSIONS and EMISSION REDUCTION OFFSETS*

NOx			1Q, lbs	2Q, lbs.	3Q, lbs.	4Q, lbs.	Annual, lbs.	Annual, tons
ERC Certificate No.	Name on Certificate	Offset Requirements (adjusted to 1.5 distance ratio)	64020	64020	93120	69840	291000	145.500
S-2362-2	Panoche Energy Center, LLC	certificate value	44097	52114	52114	52114	200439	100.220
S-2363-2	Bullard Energy Center,LLC	certificate value	22343	26405	26405	26405	50.779	
S-2214-2	LaPaloma	certificate value	22379	22627	22876	22876	90758	45.379
S-2217-2	LaPaloma	certificate value	9294	4654	14613	14.2805	28575	14.288
S-2218-2	LaPaloma	certificate value	5123	5415	2148	3593	8.1395	8.140
S-2217-2	LaPaloma	certificate value	0	9294	4654	14613	14.2805	14.2805
S-2218-2	LaPaloma	certificate value	5123	5415	2148	3593	8.1395	8.1395
		total holdings	108359	125924	124958	123208	319854	190.446
		surplus	44339	61904	31838	53368	28854	44.95

VOC			1Q, lbs	2Q, lbs.	3Q, lbs.	4Q, lbs.	Annual, lbs.	Annual, tons
ERC Certificate No.	Name on Certificate	Offset Requirements (adjusted to 1.5 distance ratio)	20010	20010	29130	21840	90990	45.500
S-2333-1	Flying J/Big West	certificate value	34685	34685	34685	34685	138740	69.370
		surplus	14675	14675	5555	12845	47750	23.87

PM10			1Q, lbs	2Q, lbs.	3Q, lbs.	4Q, lbs.	Annual, lbs.	Annual, tons
ERC Certificate No.	Name on Certificate	Offset Requirements (adjusted to 1.5 distance ratio)	40170	40170	58440	43830	182610	91.305
		SOx surplus applied to PM	51530	43690	0	143276	238496	119.25
		SOx surplus adjusted to 1.8 ratio	28628	24272	0	79598	132498	66.25
S-2209-4	LaPaloma	certificate value	8741	7519	8213	8457	32930	16.465
S-2210-4	LaPaloma	certificate value	904	923	981	961	3769	1.8845
S-2211-4	LaPaloma	certificate value	3587	3857	4416	4220	16080	8.04
S-2212-4	LaPaloma	certificate value	3382	3622	3173	3855	14032	7.016
S-2227-4	LaPaloma	certificate value	0	1079	1058	951	3088	1.544
S-2213-4	LaPaloma	certificate value	0	686	802	723	2211	1.1055
S-2363-2	Grey K Holdings	certificate value	22343	26405	26405	26405	50.779	50.779
		transfer from 1Q to 3Q	-13392		13392			
		surplus	14023	28193	0	81340	22049	62
		adjusted surplus						

SOx			1Q, lbs	2Q, lbs.	3Q, lbs.	4Q, lbs.	Annual, lbs.	Annual, tons
ERC Certificate No.	Name on Certificate	projected actual emissions (distance ratio does not apply)	3560	3560	5180	3900	16200	8.1
N-74-5	J.R. Simplot	certificate value	1560	1560	1560	1560	6240	3.120
N-268-5	J.R. Simplot	certificate value	53530	49310	0	145616	248456	124.228
		transfer from 2Q to 3Q		-3620	3620			
		surplus	51530	43690	0	143276	238496	119.248

Consistent with AQ-1, PEC will submit to the CEC updated correspondence from the SJVAPCD related to the transfer of ERCs from prior holders to the Applicant.

TECHNICAL AREA: AIR QUALITY

Data Request 11 Rev: Please provide correspondence with the District indicating that they have accepted the proposed SO2 for PM 10 interpollutant offset trading ratio at least one month prior to the publication of the Preliminary Staff Assessment.

Response:

In a meeting with the District on January 4, 2007, the District stated that they have reviewed PEC's SOx-PM10 inter-pollutant ratio proposal and are continuing their assessment. They stated that a final determination would be made and delivered to PEC before February 27, 2007 so as to accommodate CEC's data request for such determination. See Attachment C of AQ-3 for PEC's development of its 1.8 to 1 SOx-PM10 ratio proposal to the District.

TECHNICAL AREA: AIR QUALITY

Data Request 12 Rev: Please provide emission estimates for these two construction activities and indicate if they will overlap the schedule for any of the other construction activities.

Response:

A revised schedule for the entire construction effort is provided below. The well drilling and tree removal tasks have been added and will occur sequentially before (not overlapping with) site grading,. Natural gas pipeline construction and expansion within the existing PG&E substation have been added to months 13 through 18, overlapping part of the facilities building task.

Estimated pollutant emissions for all construction tasks are presented in a new Excel workbook (starting on the following page) with separate spreadsheets for the equipment exhaust and fugitive dust emissions associated with each distinct construction activity. These revised spreadsheets replace those originally presented in Appendix I, Attachment B of the AFC.

EXPECTED PEC CONSTRUCTION SCHEDULE

Injection Well Installation
Month 1
2 wells drilled

Production Well Installation
Months 2 and 3
2 wells drilled

Clearing and Grubbing (Removal of Trees)
Month 4

Civil Work (Site Grading)
Months 5 and 6

Facility Building
Months 7 - 16
Includes 8 months Concrete Pouring

Natural Gas Pipeline Construction
Month 13
Overlaps in time with Facility Building

Substation Expansion n
Months14 - 18
Overlaps in time with Facility Building

APPENDIX I

AIR QUALITY DATA

ATTACHMENT B (REVISED)

SUPPORTING INFORMATION ON ESTIMATION OF PROJECT CONSTRUCTION EMISSIONS

Construction Emissions

Annual Emissions

			Daily Emissions (lb/day)						Annual Emissions (tons/year)					
Activity	**Months**	**Emission Type**	**PM10**	**PM2.5**	**CO**	**VOC**	**NOx**	**SOx**	**PM10**	**PM2.5**	**CO**	**VOC**	**NOx**	**SOx**
Injection Well Installation	1	Combustion exhaust	5.60	5.15	92.61	26.14	303.45	0.33	0.09	0.08	0.80	0.23	2.57	0.00
	Month 1	Fugitive dust	0.53	0.11					0.00	0.00				
Total Emissions from Injection Well Installation			**6.1**	**5.3**	**92.6**	**26.1**	**303.4**	**0.3**	**0.1**	**0.1**	**0.8**	**0.2**	**2.6**	**0.0**
Production Well Installation	2	Combustion exhaust	6.08	5.60	47.30	14.27	142.33	0.17	0.20	0.19	1.68	0.50	5.28	0.01
	Months 2, 3	Fugitive dust	0.53	0.11					0.00	0.000				
Total Emissions from Production Well Installation			**6.6**	**5.7**	**47.3**	**14.3**	**142.3**	**0.2**	**0.2**	**0.2**	**1.7**	**0.5**	**5.3**	**0.0**
Clearing and Grubbing	1	Combustion exhaust	3.58	3.29	32.29	9.22	85.67	0.07	0.02	0.02	0.18	0.05	0.47	0.00
	Month 4	Fugitive dust	21.82	4.63					0.12	0.15				
Total Emissions from Clearing and Grubbing			**25.4**	**7.9**	**32.3**	**9.2**	**85.7**	**0.1**	**0.1**	**0.2**	**0.2**	**0.1**	**0.5**	**0.0**
Site Grading	2	Combustion exhaust	5.62	5.17	53.98	14.37	137.93	0.12	0.12	0.11	1.19	0.32	3.03	0.00
	Months 5, 6	Fugitive dust	30.95	6.50					1.54	0.19				
Total Emissions from Site Grading			**36.6**	**11.7**	**54.0**	**14.4**	**137.9**	**0.1**	**1.7**	**0.3**	**1.2**	**0.3**	**3.0**	**0.0**
Facilities Building	10	Combustion exhaust	6.42	5.91	49.01	15.02	128.33	0.12	0.71	0.65	5.39	1.65	14.12	0.01
	Month 7 - 16	Fugitive dust	4.6211	0.98					0.51	0.11				
Total Emissions from Facilities Building			**11.0**	**6.9**	**49.0**	**15.0**	**128.3**	**0.1**	**1.2**	**0.8**	**5.4**	**1.7**	**14.1**	**0.0**
Pipeline Construction	1	Combustion exhaust	2.81	2.59	19.51	6.77	54.55	0.13	0.03	0.03	0.21	0.07	0.60	0.00
	Month 13	Fugitive dust	4.38	0.93					0.05	0.01				
Total Emissions from Pipeline Construction			**7.2**	**3.5**	**19.5**	**6.8**	**54.5**	**0.1**	**0.1**	**0.0**	**0.2**	**0.1**	**0.6**	**0.0**
Substation Expansion	5	Combustion exhaust	1.53	1.41	9.90	3.49	15.61	0.01	0.08	0.08	0.54	0.19	0.86	0.00
	Months 14 - 18	Fugitive dust	6.89	1.46					0.38	0.08				
Total Construction Emissions from Substation Expansion			**8.4**	**2.9**	**9.9**	**3.5**	**15.6**	**0.0**	**0.5**	**0.2**	**0.5**	**0.2**	**0.9**	**0.0**
Commuter Vehicles	18	Combustion exhaust	0.86	0.15	138.46	14.94	14.70	0.10	0.11	0.02	18.28	1.97	1.94	0.01
	Months 1 - 18	Fugitive dust	69.12	11.68					9.12	1.54				
Total Emissions from Construction Worker Commuter Vehicles			**70.0**	**11.83**	**138.46**	**14.94**	**14.70**	**0.10**	**9.2**	**1.6**	**18.3**	**2.0**	**1.9**	**0.0**
Highest Daily Emissions from Any Activity (pounds)			**70.0**	**11.8**	**138.5**	**26.1**	**303.4**	**0.3**						
Total Annual Emissions from All Activities									**13.1**	**3.3**	**28.3**	**5.0**	**28.9**	**0.0**

Injection Well Installation - Diesel Fired Equipment

Activity occurs in month 1 only.

					Emission factors (lb/hr)						Hourly Emissions (lb/hr)						Daily Emissions (lb/day)						Annual Emissions (ton/yr)					
Equipment	**Quantity**	**Hours/Day**	**Horsepower**	**Days/year**	**PM10**	**PM2.5**	**CO**	**VOC**	**NOx**	**SOx**	**PM10**	**PM2.5**	**CO**	**VOC**	**NOx**	**SOx**	**PM10**	**PM2.5**	**CO**	**VOC**	**NOx**	**SOx**	**PM10**	**PM2.5**	**CO**	**VOC**	**NOx**	**SOx**
Drill Rig	1	24	750	18	0.134	0.123	1.122	0.337	4.655	0.006	0.13	0.12	1.12	0.34	4.65	0.01	1.07	0.99	26.93	8.08	111.71	0.15	0.029	0.027	0.242	0.073	1.005	0.001
Generator	2	24	200	28	0.078	0.071	0.704	0.196	1.924	0.002	0.16	0.14	1.41	0.39	3.85	0.00	1.24	1.14	33.78	9.39	92.35	0.09	0.052	0.048	0.473	0.132	1.293	0.001
Mud Pump	2	10	500	6	0.115	0.106	1.202	0.298	3.599	0.003	0.23	0.21	2.40	0.60	7.20	0.01	2.30	2.11	24.05	5.96	71.98	0.07	0.007	0.006	0.072	0.018	0.216	0.000
Concrete Truc	1	4	400	8	0.091	0.084	0.771	0.250	2.512	0.002	0.09	0.08	0.77	0.25	2.51	0.002	0.37	0.34	3.08	1.00	10.05	0.01	0.001	0.001	0.012	0.004	0.040	3.808E-05
Loging Truck	1	8	300	2	0.078	0.072	0.597	0.212	2.170	0.002	0.08	0.07	0.60	0.21	2.17	0.00	0.62	0.57	4.77	1.70	17.36	0.02	0.001	0.001	0.005	0.002	0.017	0.000
										Total	**0.69**	**0.63**	**6.30**	**1.79**	**20.38**	**0.02**	**5.60**	**5.15**	**92.61**	**26.14**	**303.45**	**0.33**	**0.09**	**0.08**	**0.80**	**0.23**	**2.57**	**0.003**

Notes:
Equipment list, quantity, horsepower, and hours of operation from EIF and Bibb
Emission factors from CARB Off-road Mobile Source Emission Factors (2006-2020). (2007 data used). Values presented are scaled to match the HP presented.
PM2.5 emission factors from updated CEIDARS List with PM2.5 fractions. PM2.5 numbers obtained by multiplying the PM10 values by fraction in CEIDARS list for onroad or offroad diesel vehicles.
Concrete Truck and Loging Truck are Off-Highway Trucks.

MODEL EMISSION RATE INPUTS (pounds per hour)

Drill Rig

CO 1-HR	CO 8-HR	NOx 1-HR	NOx Annual
1.12	1.12	4.65	0.2295
PM10 24-HR	PM10 Ann	PM2.5 24-H	PM2.5 Annual
0.13	0.0066	0.12	0.0061
SO2 1-HR	SO2 3-HR	SO2 24-HR	SO2 Annual
0.01	0.01	0.02	3.06E-04

Generator

CO 1-HR	CO 8-HR	NOx 1-HF	NOx Annual
1.41	1.41	3.85	0.2952
PM10 24-	PM10 Ani	PM2.5 24-	PM2.5 Annual
0.16	0.0119	0.14	0.0109
SO2 1-HF	SO2 3-HF	SO2 24-H	SO2 Annual
3.74E-03	3.74E-03	0.01	2.87E-04

Mud Pump

CO 1-H	CO 8-H	NOx 1-I	NOx Annual
2.40	2.40	7.20	0.0493
PM10 2	PM10 A	PM2.5 2	PM2.5 Annual
0.29	0.0016	0.26	0.0014
SO2 1-H	SO2 3-H	SO2 24	SO2 Annual
0.01	0.01	0.01	4.66E-05

Loging Truck

CO 1-HR	CO 8-HR	NOx 1-HR	NOx Annual
0.60	0.60	2.17	0.0040
PM10 24-HR	PM10 Ann	PM2.5 24-H	PM2.5 Annual
0.08	0.0001	0.07	0.0001
SO2 1-HR	SO2 3-HR	SO2 24-HR	SO2 Annual
2.06E-03	2.06E-03	2.06E-03	3.76E-06

InjWell (Concrete Truck)

CO 1-HR	CO 8-HR	NOx 1-HF	NOx Annual
0.77	0.77	2.51	0.0092
PM10 24-	PM10 Ani	PM2.5 24-	PM2.5 Annual
0.05	2.28E-04	0.04	2.28E-04
SO2 1-HF	SO2 3-HF	SO2 24-H	SO2 Annual
2.38E-03	2.38E-03	1.19E-03	8.69E-06

Minor differences between inputs and calculated values are due to rounding differences.

Travel on unpaved road

Activity occurs in month 1 only.

F = 2.1 * G/12 * H/30 * $(J/3)^{0.7}$ * $(I/4)^{0.5}$ * (365-K)/365 SCAQMD Table A9-9-D

Emission factor for vehicle travel on unpaved roads (lb/VMT)

16 G = Surface silt loading (%) (from Table A9-9-D-1 for farm road)

5 H = Mean vehicle speed (mph)

10 I = Mean number of wheels on vehicle (from Table A9-9-D-3)

16.5 J = Mean vehicle weight (ton) (from Table A9-9-D-3)

98 K = Mean number of days per year with at least 0.01 inches of precipitation (from Panoche Junction COOP weather station Western Regional Climate Center)

1.780 PM10 lb/VMT

Equipment	Quantity	Hours/Day	Days/year	Miles travelled per hour	Watering Control Efficiency	PM10 Emissions (lb/hr)	PM10 Emissions (lb/day)	PM10 Emissions (tons/yr)	PM2.5 Emissions (lb/hr)	PM2.5 Emissions (lb/day)	PM2.5 Emissions (tons/yr)
Drill Rig	1	24	24	0	85%	0.00	0.00	0.00	0.00	0.00	0.000
Concrete Trucl	1	4	10	0.5	85%	0.13	0.53	0.003	0.03	0.11	0.001
Loging Truck	1	8	8	0	85%	0.00	0.00	0.00	0.00	0.00	0.000
					Total	**0.13**	**0.53**	**0.003**	**0.03**	**0.11**	**0.001**

Equipment won't move once onsite, except for concrete truck.

Distance from road to farthest well site is 0.25 miles, 0.5 mile onsite RT used as worst-case.

Water efficiency from CEQA Table 11-4 watering 3 times daily or using chemical suppressants

PM2.5 emission factors from updated CEIDARS List with PM2.5 fractions.

PM2.5 numbers obtained by multiplying the PM10 values by fraction in CEIDARS list for appropriate fugitive dust sources.

MODEL EMISSION RATE INPUTS (pounds per hour)

PM10 24-HR	PM10 Annu	PM2.5 24-HF	PM2.5 Annual
0.0663	0.0007	0.0138	0.0002

Minor differences between inputs and calculated values are due to rounding differences.

Production Water Well Installation - Diesel Fired Equipment

Activity occurs in months 2 and 3 only.

					Emission factors (lb/hr)						Hourly Emissions (lb/hr)						Daily Emissions (lb/day)						Annual Emissions (ton/yr)					
Equipment	**Quantity**	**Hours/Day**	**Horsepower**	**Days/year**	**PM10**	**PM2.5**	**CO**	**VOC**	**NOx**	**SOx**	**PM10**	**PM2.5**	**CO**	**VOC**	**NOx**	**SOx**	**PM10**	**PM2.5**	**CO**	**VOC**	**NOx**	**SOx**	**PM10**	**PM2.5**	**CO**	**VOC**	**NOx**	**SOx**
Drill Rig	1	24	500	100	0.066	0.061	0.568	0.163	2.233	0.003	0.07	0.06	0.57	0.16	2.23	0.00	1.58	1.46	13.63	3.91	53.60	0.07	0.079	0.073	0.681	0.195	2.680	0.004
Air Compressors	1	24	200	140	0.060	0.055	0.479	0.144	1.299	0.001	0.06	0.05	0.48	0.14	1.30	0.00	1.43	1.32	11.50	3.46	31.17	0.03	0.100	0.092	0.805	0.242	2.182	0.002
Generator	1	12	25	140	0.012	0.011	0.114	0.035	0.180	0.000	0.01	0.01	0.11	0.03	0.18	0.00	0.15	0.14	1.37	0.42	2.16	0.00	0.010	0.010	0.096	0.029	0.151	0.000
Concrete Truck	1	1	400	2	0.091	0.084	0.771	0.250	2.512	0.002	0.09	0.08	0.77	0.25	2.51	0.00	0.09	0.08	0.77	0.25	2.51	0.00	0.000	0.000	0.001	0.000	0.003	0.000
Water Pump	1	24	120	10	0.082	0.076	0.527	0.169	1.049	0.001	0.08	0.08	0.53	0.17	1.05	0.00	1.97	1.81	12.64	4.04	25.17	0.02	0.010	0.009	0.063	0.020	0.126	0.000
Welder	1	8	25	6	0.009	0.008	0.073	0.029	0.115	0.000	0.01	0.01	0.07	0.03	0.12	0.00	0.07	0.06	0.58	0.24	0.92	0.00	0.000	0.000	0.002	0.001	0.003	0.000
Pump Test Rig	1	12	500	10	0.066	0.061	0.568	0.163	2.233	0.003	0.07	0.06	0.57	0.16	2.23	0.00	0.79	0.73	6.81	1.95	26.80	0.04	0.004	0.004	0.034	0.010	0.134	0.000
										Total	**0.39**	**0.36**	**3.10**	**0.95**	**9.62**	**0.01**	**6.08**	**5.60**	**47.30**	**14.27**	**142.33**	**0.17**	**0.20**	**0.19**	**1.68**	**0.50**	**5.28**	**0.01**

Notes:
Equipment list, quantity, horsepower, and hours of operation from EIF and Bibb
Emission factors from CARB Off-road Mobile Source Emission Factors (2006-2020). (2007 data used). Values presented are scaled to match the HP presented.
PM2.5 emission factors from updated CEIDARS List with PM2.5 fractions. PM2.5 numbers obtained by multiplying the PM10 values by fraction in CEIDARS list for onroad or offroad diesel vehicles.
Concrete Truck is Off-Highway Trucks.
Only one Concrete Truck will be onsite at any time.

Travel on unpaved road

Activity occurs in months 2 and 3 only.

$F = 2.1 * G/12 * H/30 * (J/3)^{0.7} * (I/4)^{0.5} * (365-K)/365$ SCAQMD Table A9-9-D

Emission factor for vehicle travel on unpaved roads (lb/VMT)

16 G = Surface silt loading (%) (from Table A9-9-D-1 for farm road)

5 H = Mean vehicle speed (mph)

10 I = Mean number of wheels on vehicle (from Table A9-9-D-3)

16.5 J = Mean vehicle weight (ton) (from Table A9-9-D-3)

98 K = Mean number of days per year with at least 0.01 inches of precipitation (from Panoche Junction COOP weather station Western Regional Climate Center)

1.780 PM10 lb/VMT

Equipment	Quantity	Hours/Day	Days/year	Miles travelled per hour	Watering Control Efficiency	PM10 Emissions (lb/hr)	PM10 Emissions (lb/day)	PM10 Emissions (tons/yr)	PM2.5 Emissions (lb/hr)	PM2.5 Emissions (lb/day)	PM2.5 Emissions (tons/yr)
Drill Rig	1	24	100	0	85%	0.00	0.00	0.00	0.00	0.00	0.000
Concrete Truck	1	4	2	0.5	85%	0.13	0.53	0.00	0.03	0.11	0.000
Pump Test Rig	1	12	10	0	85%	0.00	0.00	0.00	0.00	0.00	0.000
					Total	**0.13**	**0.53**	**0.00**	**0.03**	**0.11**	**0.000**

Equipment won't move once onsite, except for concrete truck.

Distance from road to farthest well site is 0.25 miles, 0.5 mile RT used as worst-case.

Water efficiency from CEQA Table 11-4 watering 3 times daily or using chemical suppressants

PM2.5 emission factors from updated CEIDARS List with PM2.5 fractions.

PM2.5 numbers obtained by multiplying the PM10 values by fraction in CEIDARS list for appropriate fugitive dust sources.

Only one Concrete Truck will be onsite at any time.

Clearing and Grubbing - Diesel Fired Equipment

Activity occurs in month 4 only.

					Emission factors (lb/hr)						Hourly Emissions (lb/hr)						Daily Emissions (lb/day)						Annual Emissions (ton/yr)					
Equipment	**Quantity**	**Hours/Day**	**Horsepower**	**Days/year**	**PM10**	**PM2.5**	**CO**	**VOC**	**NOx**	**SOx**	**PM10**	**PM2.5**	**CO**	**VOC**	**NOx**	**SOx**	**PM10**	**PM2.5**	**CO**	**VOC**	**NOx**	**SOx**	**PM10**	**PM2.5**	**CO**	**VOC**	**NOx**	**SOx**
Wheeled Loader	1	8	500	11	0.098	0.09	0.971	0.253	2.604	0.002	0.10	0.09	0.97	0.25	2.60	0.00	0.78	0.72	7.76	2.02	20.83	0.02	0.004	0.004	0.043	0.011	0.115	0.000
Tracked Dozer	1	8	500	11	0.129	0.119	1.526	0.332	3.198	0.003	0.13	0.12	1.53	0.33	3.20	0.00	1.03	0.95	12.21	2.66	25.58	0.02	0.006	0.005	0.067	0.015	0.141	0.000
Dump Trucks	1	8	300	11	0.078	0.071	0.597	0.212	2.17	0.002	0.08	0.07	0.60	0.21	2.17	0.00	0.62	0.57	4.77	1.70	17.36	0.02	0.003	0.003	0.026	0.009	0.095	0.000
Water Trucks	1	8	250	11	0.071	0.065	0.51	0.193	1.999	0.002	0.07	0.07	0.51	0.19	2.00	0.00	0.57	0.52	4.08	1.55	15.99	0.02	0.003	0.003	0.022	0.009	0.088	0.000
Chipper	1	8	100	11	0.072	0.066	0.433	0.162	0.738	0.00	0.07	0.07	0.43	0.16	0.74	0.00	0.57	0.53	3.46	1.29	5.91	0.00	0.003	0.003	0.019	0.007	0.032	0.000
									Total		**0.45**	**0.41**	**4.04**	**1.15**	**10.71**	**0.01**	**3.58**	**3.29**	**32.29**	**9.22**	**85.67**	**0.07**	**0.02**	**0.02**	**0.18**	**0.05**	**0.47**	**0.00**

Notes:
Equipment list, quantity, horsepower, and hours of operation from EIF and Bibb
Emission factors from CARB Off-road Mobile Source Emission Factors (2006-2020). (2007 data used). Values presented are scaled to match the HP presented.
PM2.5 emission factors from updated CEIDARS List with PM2.5 fractions. PM2.5 numbers obtained by multiplying the PM10 values by fraction in CEIDARS list for onroad or offroad diesel vehicles.
Other General Industrial Equipment emission factor is used for Chipper

Bulldozing

Activity occurs in month 4 only.

$E = p * 1 * G^{1.5} / H^{1.4}$ PM10 Emissi PM10 Emissions from dirt pushing (lb/hr)

EPA AP-42 Table 11.9-1 EMISSION FACTOR EQUATIONS FOR UNCONTROLLED OPEN DUST SOURCES AT WESTERN SURFACE COAL MINES (Overburden)

0.75 p = particle size multiplier = 0.75 for PM10

18 G = Silt content (%) (from Table A9-9-F-1 for flue dust - fine soils located at site)

16 H = Moisture content of surface material (%) (from Table A9-9-F-2 for moist dirt)

1.18 lb/hr of PM10

22.00 days of activity per month 0.5 duration of activity (months)

Equipment	Quantity	Hours/Day	Days/year	Watering Control Efficiency	PM10 Emissions (lb/hr)	PM10 Emissions (lb/day)	PM10 Emissions (tons/yr)	PM2.5 Emissions (lb/hr)	PM2.5 Emissions (lb/day)	PM2.5 Emissions (tons/yr)
Tracked Dozer	1	8	11	85%	0.177	1.42	0.01	0.04	0.30	0.00
Wheeled Loader	1	8	11	85%	0.177	1.42	0.01	0.04	0.30	0.00
				Total	**0.354**	**2.83**	**0.02**	**0.08**	**0.60**	**0.00**

Water efficiency from CEQA Table 11-4 watering 3 times daily or using chemical suppressants

Travel on unpaved road

Activity occurs in month 4 only.

$F = 2.1 * G/12 * H/30 * (J/3)^{0.7} * (I/4)^{0.5} * (365-K)/365$ SCAQMD Table A9-9-D

Emission factor for vehicle travel on unpaved roads (lb/VMT)

16 G = Surface silt loading (%) (from Table A9-9-D-1 for farm road)

5 H = Mean vehicle speed (mph)

10 I = Mean number of wheels on vehicle (from Table A9-9-D-3)

13 J = Mean vehicle weight (ton) (from Table A9-9-D-3)

98 K = Mean number of days per year with at least 0.01 inches of precipitation (from Panoche Junction COOP weather station Western Regional Climate Center)

1.507 PM10 lb/VMT

Equipment	Quantity	Hours/Day	Days/year	Miles travelled per hour	Watering Control Efficiency	PM10 Emissions (lb/hr)	PM10 Emissions (lb/day)	PM10 Emissions (tons/yr)	PM2.5 Emissions (lb/hr)	PM2.5 Emissions (lb/day)	PM2.5 Emissions (tons/yr)
Service Truck	2	2	11	1	85%	0.45	0.90	0.00	0.10	0.19	0.01
Service Trucks will operate 2 hours at end of day, not during daily activities											
Chipper	1	8	11	1	85%	0.23	1.81	0.01	0.05	0.38	0.04
Water Truck	1	8	11	5	85%	1.13	9.04	0.05	0.24	1.92	0.04
Dump Truck	1	8	11	4	85%	0.90	7.23	0.04	0.19	1.53	0.04
					Total	**2.03**	**18.98**	**0.10**	**0.57**	**4.02**	**0.14**

Assumed maximum travel speed is 10 mph

Water efficiency from CEQA Table 11-4 watering 3 times daily or using chemical suppressants

PM2.5 emission factors from updated CEIDARS List with PM2.5 fractions.

PM2.5 numbers obtained by multiplying the PM10 values by fraction in CEIDARS list for appropriate fugitive dust sources.

Site Grading - Diesel Fired Equipment

Activity occurs in months 5 and 6 only.

					Emission factors (lb/hr)						Hourly Emissions (lb/hr)						Daily Emissions (lb/day)						Annual Emissions (ton/yr)					
Equipment	**Quantity**	**Hours/Day**	**Horsepower**	**Days/year**	**PM10**	**PM2.5**	**CO**	**VOC**	**NOx**	**SOx**	**PM10**	**PM2.5**	**CO**	**VOC**	**NOx**	**SOx**	**PM10**	**PM2.5**	**CO**	**VOC**	**NOx**	**SOx**	**PM10**	**PM2.5**	**CO**	**VOC**	**NOx**	**SOx**
Wheeled Loade	1	8	500	44	0.098	0.090	0.971	0.253	2.604	0.002	0.10	0.09	0.97	0.25	2.60	0.00	0.78	0.72	7.76	2.02	20.83	0.02	0.02	0.02	0.17	0.04	0.46	0.00
Tracked Dozer	1	8	500	44	0.129	0.119	1.526	0.332	3.198	0.003	0.13	0.12	1.53	0.33	3.20	0.00	1.03	0.95	12.21	2.66	25.58	0.02	0.02	0.02	0.27	0.06	0.56	0.00
Water Truck	1	8	250	44	0.071	0.065	0.510	0.193	1.993	0.002	0.07	0.07	0.51	0.19	1.99	0.00	0.57	0.52	4.08	1.55	15.94	0.02	0.01	0.01	0.09	0.03	0.35	0.00
Compactor	1	8	150	44	0.074	0.068	0.546	0.161	1.167	0.001	0.07	0.07	0.55	0.16	1.17	0.00	0.59	0.55	4.36	1.29	9.34	0.01	0.01	0.01	0.10	0.03	0.21	0.00
Motor Grader	1	8	220	44	0.084	0.078	0.650	0.208	1.939	0.002	0.08	0.08	0.65	0.21	1.94	0.00	0.68	0.62	5.20	1.67	15.51	0.01	0.01	0.01	0.11	0.04	0.34	0.00
Dump Trucks	1	8	400	44	0.091	0.084	0.771	0.250	2.512	0.002	0.09	0.08	0.77	0.25	2.51	0.00	0.73	0.67	6.17	2.00	20.09	0.02	0.02	0.01	0.14	0.04	0.44	0.00
Scrapers	1	8	460	44	0.155	0.143	1.774	0.399	3.828	0.003	0.16	0.14	1.77	0.40	3.83	0.00	1.24	1.14	14.20	3.19	30.62	0.02	0.03	0.03	0.31	0.07	0.67	0.00
				Total	**0.70**	**0.65**	**6.75**	**1.80**	**17.24**	**0.015**	**5.62**	**5.17**	**53.98**	**14.37**	**137.93**	**0.12**	**0.12**	**0.11**	**1.19**	**0.32**	**3.03**	**0.003**						

Notes:
Equipment list, quantity, horsepower, and hours of operation from EIF and Bibb
Emission factors from CARB Off-road Mobile Source Emission Factors (2006-2020). (2007 data used). Values presented are scaled to match the HP presented.
PM2.5 emission factors from updated CEIDARS List with PM2.5 fractions. PM2.5 numbers obtained by multiplying the PM10 values by fraction in CEIDARS list for onroad or offroad diesel vehicles.

MODEL EMISSION RATE INPUTS (pounds per hour)

CO 1-HR	CO 8-HR	NOx 1-HR	NOx Annual
6.75	6.75	17.24	0.6928

PM10 24-HR	PM10 Ann	PM2.5 24-H	PM2.5 Annual
0.70	0.0282	0.65	0.0260

SO2 1-HR	SO2 3-HR	SO2 24-HR	SO2 Annual
0.01	0.01	0.01	5.96E-04

Minor differences between inputs and calculated values are due to rounding differences.
(1 volume source)

Bulldozing

Activity occurs in months 5 and 6 only.

$E = p * 1 * G^{1.5} / H^{1.4}$ PM10 Emissions from bulldozing (lb/hr)

EPA AP-42 Table 11.9-1 EMISSION FACTOR EQUATIONS FOR UNCONTROLLED OPEN DUST SOURCES AT WESTERN SURFACE COAL MINES (Overburden)

0.75 p = particle size multiplier = 0.75 for PM10

18 G = Silt content (%) (from Table A9-9-F-1 for flue dust - fine soils located at site)

16 H = Moisture content of surface material (%) (from Table A9-9-F-2 for moist dirt)

1.18 lb/hr of PM10

Equipment	Quantity	Hours/Day	Days/year	Watering Control Efficiency	PM10 Emissions (lb/hr)	PM10 Emissions (lb/day)	PM10 Emissions (tons/yr)	PM2.5 Emissions (lb/hr)	PM2.5 Emissions (lb/day)	PM2.5 Emissions (tons/yr)
Scrapers	1	8	44	85%	0.18	1.42	0.03	0.04	0.31	0.01
Tracked Dozer	1	8	44	85%	0.18	1.42	0.03	0.04	0.31	0.01
Compactor	1	8	44	85%	0.18	1.42	0.03	0.04	0.31	0.01
				Total	**0.53**	**4.25**	**0.09**	**0.12**	**0.94**	**0.02**

22 construction days per month

2 duration of activity (months)

Water efficiency from CEQA Table 11-4 watering 3 times daily or using chemical suppressants

Grading

Activity occurs in months 5 and 6 only.

$E = p^* .051 * (S)^{2.0}$

0.6 p = particle size multiplier = 0.60 for PM10

5 S = avg speed of vehicle (mph) (from AP-42 Table 11.9-3)

0.77 lb/VMT PM10 EPA AP-42 Table 11.9-1 EMISSION FACTOR EQUATIONS FOR UNCONTROLLED OPEN DUST SOURCES AT WESTERN SURFACE COAL MINES

Equipment	Quantity	Hours/Day	Days/year	Miles travelled per hour	Watering Control Efficiency	PM10 Emissions (lb/hr)	PM10 Emissions (lb/day)	PM10 Emissions (tons/yr)	PM2.5 Emissions (lb/hr)	PM2.5 Emissions (lb/day)	PM2.5 Emissions (tons/yr)
Motor Grader	1	8	44	2	85%	0.23	1.84	0.04	0.05	0.41	0.01

Water efficiency from CEQA Table 11-4 watering 3 times daily or using chemical suppressants

Truck filling or storage pile emptying

PM10 emissions per ton of material handled (SCAQMD Table A9-9)

0.02205 lb/ton

Truck dumping

PM10 emissions per ton of material handled (SCAQMD Table A9-9)

0.009075 lb/ton

Equipment	Quantity	Hours/Day	Days/year	Material Handled (ton/day)	Material Handled (ton)	Watering Control Efficiency	PM10 Emissions (lb/hr)	PM10 Emissions (lb/day)	PM10 Emissions (tons/yr)	PM2.5 Emissions (lb/hr)	PM2.5 Emissions (lb/day)	PM2.5 Emissions (tons/yr)
Wheeled Loader	1	8	44	1398	61,504	85%	0.58	4.62	0.58	0.13	1.03	0.02
Dump Trucks	1	8	44	1398	61,504	85%	0.24	1.90	0.24	0.05	0.42	0.01
						Total	**0.82**	**6.53**	**0.81**	**0.18**	**1.45**	**0.03**

Water efficiency from CEQA Table 11-4 watering 3 times daily or using chemical suppressants

1216 yd3/day 1398 ton/day 48.6 trucks/day 1.0 trucks/hr

53,482 yd3 61,504 tons 2300 density of soil (lb/yd3) (USDA NRCS Physical Soil Properties from Fresno County Western Part for Panoche Clay Loam soil)

assume all soil moved in first 2 months (44 days)

assume each dump truck carries 25 yd3 = 28.75 tons

assume each truck can haul 6 loads per hour

22.1 acres (entire site) = 53,482 square yds, assume depth of 0.5 yd of soils moved

Cover Storage Pile
Activity occurs in months 5 and 6 only.
SCAQMD Table A9-9-E
E = 1.7 * G/1.5 * (365-H)/235 * I/15 * J
PM10 Emission factor from wind erosion of storage piles per day per acre

15	G = Silt content (%) (from Table A9-9-E-1 for blended dirt)
98	H = Number of days with >= 0.01 inches of precipitation per year (from Panoche Junction COOP weather station WRCC)
8	I = Percentage of time that the unobstructed wind speed exceeds 12 mph at mean pile height
0.5	J = Fraction of TSP that is PM10 = 0.5
5.151	lb/acre/day

wind speed percentage based on 1984-92 (9 yrs) of wind speed data (actual hours > 10 knots) as recorded at Fresno Air Terminal data from EPA SCRAM website

Source	Quantity	Size of Pile (acre)	Hours/Day	Days/year	Watering Control Efficiency	PM10 Emissions (lb/hr)	PM10 Emissions (lb/day)	PM10 Emissions (tons/yr)	PM2.5 Emissions (lb/hr)	PM2.5 Emissions (lb/day)	PM2.5 Emissions (tons/yr)
Cover Storage Pile	1	1.5	24	365	85%	0.05	1.16	0.21	0.01	0.26	0.05

Water efficiency from CEQA Table 11-4 watering 3 times daily or using chemical suppressants
pile size assumed

Travel on unpaved road
Activity occurs in months 5 and 6 only.
F = 2.1 * G/12 * H/30 * $(J/3)^{0.7}$ * $(I/4)^{0.5}$ * (365-K)/365 SCAQMD Table A9-9-D
Emission factor for vehicle travel on unpaved roads (lb/VMT)

16	G = Surface silt loading (%) (from Table A9-9-D-1 for farm road)
5	H = Mean vehicle speed (mph)
10	I = Mean number of wheels on vehicle (from Table A9-9-D-3)
13	J = Mean vehicle weight (ton) (from Table A9-9-D-3)
98	K = Mean number of days per with at least 0.01 inches of precipitation (from Panoche Junction COOP weather station Western Regional Climate Center)
1.507	PM10 lb/VMT

MODEL EMISSION RATE INPUTS (pounds per hour)

PM10 24-H	PM10 Annua	PM2.5 24-H	PM2.5 Annual
3.8683	0.3509	0.8373	0.0431

Minor differences between inputs and calculated values are due to rounding differences.

Equipment	Quantity	Hours/Day	Days/year	Miles travelled per hour	Watering Control Efficiency	PM10 Emissions (lb/hr)	PM10 Emissions (lb/day)	PM10 Emissions (tons/yr)	PM2.5 Emissions (lb/hr)	PM2.5 Emissions (lb/day)	PM2.5 Emissions (tons/yr)
Service Truck	2	2	44	1	85%	0.45	0.90	0.02	0.10	0.19	0.00
Service Trucks will operate 2 hours at end of day, not during daily activities											
Water Truck	1	8	44	5	85%	1.13	9.04	0.20	0.24	1.92	0.04
Dump Truck	1	8	44	4	85%	0.90	7.23	0.16	0.19	1.53	0.03
					Total	**2.03**	**17.17**	**0.38**	**0.53**	**3.64**	**0.08**

Assumed maximum travel speed is 10 mph
Equipment weight from SCAQMD Table A9-9-D-3 for Waste Dump trucks
Water efficiency from CEQA Table 11-4 watering 3 times daily or using chemical suppressants
PM2.5 emission factors from updated CEIDARS List with PM2.5 fractions.
PM2.5 numbers obtained by multiplying the PM10 values by fraction in CEIDARS list for appropriate fugitive dust sources.

Site Building - Diesel Fired Equipment

Activity occurs in months 7 through 16 only.

					Emission factors (lb/hr)						Hourly Emissions (lb/hr)						Daily Emissions (lb/day)						Annual Emissions (ton/yr)					
Equipment	**Quantity**	**Hours/Day**	**Horsepower**	**Days/year**	**PM10**	**PM2.5**	**CO**	**VOC**	**NOx**	**SOx**	**PM10**	**PM2.5**	**CO**	**VOC**	**NOx**	**SOx**	**PM10**	**PM2.5**	**CO**	**VOC**	**NOx**	**SOx**	**PM10**	**PM2.5**	**CO**	**VOC**	**NOx**	**SOx**
Water Truck	1	8	250	220	0.071	0.065	0.510	0.193	1.999	0.002	0.07	0.07	0.51	0.19	2.00	0.00	0.57	0.52	4.08	1.55	15.99	0.02	0.06	0.06	0.45	0.17	1.76	0.00
Forklift	1	8	120	220	0.043	0.039	0.234	0.079	0.436	0.000	0.04	0.04	0.23	0.08	0.44	0.00	0.34	0.32	1.87	0.63	3.49	0.00	0.04	0.03	0.21	0.07	0.38	0.00
Portable Air Compres	1	8	120*	220	0.059	0.054	0.342	0.116	0.676	0.001	0.06	0.05	0.34	0.12	0.68	0.00	0.47	0.43	2.73	0.93	5.41	0.00	0.05	0.05	0.30	0.10	0.60	0.00
Welder	2	8	120*	220	0.047	0.043	0.280	0.093	0.556	0.001	0.09	0.09	0.56	0.19	1.11	0.00	0.75	0.69	4.48	1.49	8.89	0.01	0.08	0.08	0.49	0.16	0.98	0.00
Concrete Truck	1	8	400	220	0.091	0.084	0.771	0.250	2.515	0.002	0.09	0.08	0.77	0.25	2.52	0.00	0.73	0.67	6.17	2.00	20.12	0.02	0.08	0.07	0.68	0.22	2.21	0.00
Concrete Boom Truc	1	8	250	220	0.071	0.065	0.510	0.193	1.999	0.002	0.07	0.07	0.51	0.19	2.00	0.00	0.57	0.52	4.08	1.55	15.99	0.02	0.06	0.06	0.45	0.17	1.76	0.00
Aerial Lift	2	8	120	220	0.043	0.039	0.234	0.079	0.436	0.000	0.09	0.08	0.47	0.16	0.87	0.00	0.68	0.63	3.74	1.26	6.97	0.01	0.08	0.07	0.41	0.14	0.77	0.00
Light Plant	1	4	120*	220	0.090	0.082	0.561	0.171	1.058	0.001	0.09	0.08	0.56	0.17	1.06	0.00	0.36	0.33	2.24	0.68	4.23	0.00	0.04	0.04	0.25	0.08	0.47	0.00
Electrical Generator	1	8	175*	220	0.080	0.073	0.757	0.194	1.694	0.002	0.08	0.07	0.76	0.19	1.69	0.00	0.64	0.59	6.06	1.56	13.55	0.01	0.07	0.06	0.67	0.17	1.49	0.00
Crane	2	8	500	220	0.082	0.075	0.848	0.212	2.105	0.002	0.16	0.15	1.70	0.42	4.21	0.00	1.31	1.21	13.57	3.39	33.68	0.03	0.14	0.13	1.49	0.37	3.70	0.00
Notes:										**Total**	**0.85**	**0.78**	**6.41**	**1.96**	**16.57**	**0.02**	**6.42**	**5.91**	**49.01**	**15.02**	**128.33**	**0.12**	**0.71**	**0.65**	**5.39**	**1.65**	**14.12**	**0.01**

* - Equipment hp rating assumed

Equipment list, quantity, horsepower, and hours of operation EIF and Bibb

Emission factors from CARB Off-road Mobile Source Emission Factors (2006-2020). (2007 data used).

Values presented are scaled (as needed) to match the HP presented.

PM2.5 emission factors from updated CEIDARS List with PM2.5 fractions.

PM2.5 numbers obtained by multiplying the PM10 values by fraction in CEIDARS list for onroad or offroad diesel vehicles.

All Trucks are assumed to be Off-Highway Trucks.

Aerial Lift is a Forklift, Light Plant is Other Construction Equipment.

EMISSION FACTOR FOR ONROAD VEHICLES

					EF (lbs/mile)				
Onroad Vehicle	**Fuel Type**	**Vehicle Count**	**Weight (lbs)**	**Vehicle Type**	**TOC**	**CO**	**NOx**	**PM_{10}**	**SO_2**
Passenger Vehicles	G/D	120	4000	LDA	1.38E-03	1.28E-02	1.36E-03	8.00E-05	9.00E-06

Emission factors from SCAQMD Emission Factors for Onroad Vehicles for 2007 from EMFAC2002 (version 2.2)

EMISSION CALCULATION FOR ONROAD VEHICLES

					Daily Emissions (lbs)					
	Total Op.	**Trips or Hours/Day**	**Round Trip Distance**	**Daily Total VMT**	**TOC**	**CO**	**NOx**	**PM_{10}**	**SO_2**	**PM2.5**
Highway Vehicles	**Total Days**									
Passenger Vehicles	264	1	90	10800	14.9	138.5	14.7	0.9	9.72E-02	0.1

Annual Emission Rate (tons/year)					
TOC	**CO**	**NOx**	**PM10**	**SO2**	**PM2.5**
1.97	18.28	1.94	0.11	0.01	0.02

MODEL EMISSION RATE INPUTS (pounds per hour)

CO 1-HR	CO 8-HR	NOx 1-HR	NOx Annual
2.14	2.14	5.52	1.0743
PM10 24-HR	**PM10 Annual**	**PM2.5 24-HR**	**PM2.5 Annual**
0.27	0.0537	0.25	0.0494
SO2 1-HR	**SO2 3-HR**	**SO2 24-HR**	**SO2 Annual**
0.01	0.01	0.00	9.80E-04

Minor differences between inputs and calculated values are due to rounding differences.
(3 volume sources)

Travel on unpaved road

Activity occurs in months 7 through 16 only.

$F = 2.1 * G/12 * H/30 * (J/3)^{0.7} * (I/4)^{0.5} * (365-K)/365$ SCAQMD Table A9-9-D

Emission factor for vehicle travel on unpaved roads (lb/VMT)

16	G = Surface silt loading (%) (from Table A9-9-D-1 for farm road)
4	H = Mean vehicle speed (mph)
4	I = Mean number of wheels on vehicle (average of equipment listed below)
19.90	J = Mean vehicle weight (ton) (average of equipment listed below)
98	K = Mean number of days per with at least 0.01 inches of precipitation (from Panoche Junction COOP weather station Western Regional Climate Center)
1.027	PM10 lb/VMT

Most of the equipment onsite will not be moving on a continuous basis.
Welder, Light Plant, Generator, Compressor assumed to weigh 1000 pounds each.

Equipment	Quantity	Hours/Day	Days/year	Miles travelled per hour	Watering Control Efficiency	PM10 Emissions (lb/hr)	PM10 Emissions (lb/day)	PM10 Emissions (tons/yr)	PM2.5 Emissions (lb/hr)	PM2.5 Emissions (lb/day)	PM2.5 Emissions (tons/yr)
Service Trucks	2	2	220	1	85%	0.31	0.62	0.07	0.07	0.13	0.01
Service Trucks will operate 2 hours at end of day, not during daily activities											
Water Truck	1	8	220	3	85%	0.46	3.70	0.41	0.10	0.78	0.09
Forklift	1	8	220	1	85%	0.15	1.23	0.14	0.03	0.26	0.03
Portable Air Compressor	1	8	220	0	85%	0.00	0.00	0.00	0.00	0.00	0.00
Welder	2	8	220	0	85%	0.00	0.00	0.00	0.00	0.00	0.00
Concrete Truck	1	8	220	0.75	85%	0.12	0.92	0.10	0.02	0.20	0.02
Concrete Boom Truck	1	8	220	0	85%	0.00	0.00	0.00	0.00	0.00	0.00
Aerial Lift	2	8	220	1	85%	0.31	2.46	0.27	0.07	0.52	0.06
Light Plant	1	8	220	0	85%	0.00	0.00	0.00	0.00	0.00	0.00
Electrical Generator	1	8	220	0	85%	0.00	0.00	0.00	0.00	0.00	0.00
Crane	2	8	220	0	85%	0.00	0.00	0.00	0.00	0.00	0.00
					Total	**0.6**	**4.6**	**0.5**	**0.1**	**1.0**	**0.1**

Assumed maximum travel speed is 10 mph
Crane weight average of 4 cranes listed below.
Water and Dump Truck weights from SCAQMD Table A9-9-D-3 for Waste Dump trucks
Water efficiency from CEQA Table 11-4 watering 3 times daily or using chemical suppressants
No more than 1 concrete trucks onsite at any one time.

Passenger vehicle travel on paved roads

0.0064 PM10 lb/VMT (from Table A9-9-B-1 for major streets/highways) CEQA Table A9-9-B

Equipment	Monthly Average Number of Employees	Hours/Day	Days/year	Miles travelled per trip	Total miles travelled per year	PM10 Emissions (lb/hr)	PM10 Emissions (lb/day)	PM10 Emissions (tons/yr)	PM2.5 Emissions (lb/hr)	PM2.5 Emissions (lb/day)	PM2.5 Emissions (tons/yr)
All Employee Vehicles	120	2	264	90	2851200	34.56	69.12	9.124	5.84	11.68	1.54

Assumed average distance travelled off site for all employees commuting will be 45 miles (approximate distance to Fresno) times 2 for return trip 90 miles
Employee numbers based on total employees on site (2317) for 13 months, based on AFC Data Needs checklist item A37 - Total Workforce
Assumed 1.5 employees per vehicle
Water efficiency from CEQA Table 11-4 watering 3 times daily or using chemical suppressants
Equipment weight from Caterpillar website (www.cat.com/cda).
Concrete vehicle and Crane weights from various websites.
PM2.5 emission factors from updated CEIDARS List with PM2.5 fractions.
PM2.5 numbers obtained by multiplying the PM10 values by fraction in CEIDARS list for appropriate fugitive dust sources.

MODEL EMISSION RATE INPUTS (pounds per hour)

PM10 24-H	PM10 Annua	PM2.5 24-H	PM2.5 Annual
0.578	0.116	0.064	0.025

Minor differences between inputs and calculated values are due to rounding differences.

Equipment	Wheels	Weight (tons)	Caterpillar Model
Water Truck	10	13.00	
Forklift	4	7.74	TH330B
Portable Air Compressor	4	0.5	
Welder	4	1	
Concrete Truck	10	30	
Concrete Boom Truck	10	25	
Aerial Lift	8	15.47	TH330B
Light Plant	4	0.5	
Electrical Generator	4	0.5	
Crane		165.00	
	58	**258.71**	
	4	19.90	

Cranes (500 hp)	Weight (tons)
Terex DeMag	79.0
Lieber 1800	105
Lieber 1300	79
Grove GMK5240	67
TOTAL	**330.00**
AVERAGE WT	82.50

NG Pipeline Construction - Diesel Fired Equipment

Activity occurs in month 13 only (overlap with building construction).

					Emission factors (lb/hr)						Hourly Emissions (lb/hr)						Daily Emissions (lb/day)						Annual Emissions (ton/yr)					
Equipment	**Quantity**	**Hours/Day**	**Horsepower**	**Days/year**	**PM10**	**PM2.5**	**CO**	**VOC**	**NOx**	**SOx**	**PM10**	**PM2.5**	**CO**	**VOC**	**NOx**	**SOx**	**PM10**	**PM2.5**	**CO**	**VOC**	**NOx**	**SOx**	**PM10**	**PM2.5**	**CO**	**VOC**	**NOx**	**SOx**
Backhoe	1	8	100	22	0.061	0.056	0.382	0.132	0.592	0.001	0.06	0.06	0.38	0.13	0.59	0.00	0.49	0.45	3.05	1.06	4.74	0.00	0.005	0.005	0.034	0.012	0.052	0.000
Wheeled Dozer	1	8	250	22	0.124	0.114	0.884	0.314	2.800	0.002	0.12	0.11	0.88	0.31	2.80	0.00	0.99	0.91	7.07	2.51	22.40	0.02	0.011	0.010	0.078	0.028	0.246	0.000
Water Truck	1	8	250	22	0.071	0.065	0.510	0.193	1.999	0.002	0.07	0.07	0.51	0.19	2.00	0.00	0.57	0.52	4.08	1.55	15.99	0.02	0.006	0.006	0.045	0.017	0.176	0.000
Pipelayer	1	8	150	22	0.096	0.088	0.664	0.207	1.426	0.011	0.10	0.09	0.66	0.21	1.43	0.01	0.77	0.71	5.31	1.66	11.41	0.09	0.008	0.008	0.058	0.018	0.126	0.001
										Total	**0.35**	**0.32**	**2.44**	**0.85**	**6.82**	**0.02**	**2.81**	**2.59**	**19.51**	**6.77**	**54.55**	**0.13**	**0.03**	**0.03**	**0.21**	**0.07**	**0.60**	**0.00**

Notes:
Equipment list, quantity, horsepower, and hours of operation from EIF and Bibb
Emission factors from CARB Off-road Mobile Source Emission Factors (2006-2020). (2007 data used). Values presented are scaled to match the HP presented.
PM2.5 emission factors from updated CEIDARS List with PM2.5 fractions. PM2.5 numbers obtained by multiplying the PM10 values by fraction in CEIDARS list for onroad or offroad diesel vehicles.
Pipelayer is Crawler Tractor

Travel on unpaved road

Activity occurs in month 13 only.

$F = 2.1 * G/12 * H/30 * (J/3)^{0.7} * (I/4)^{0.5} * (365-K)/365$ SCAQMD Table A9-9-D

Emission factor for vehicle travel on unpaved roads (lb/VMT)

16 G = Surface silt loading (%) (from Table A9-9-D-1 for farm road)
2 H = Mean vehicle speed (mph)
4 I = Mean number of wheels on vehicle (from Table A9-9-D-3)
16.82 J = Mean vehicle weight (ton) (from Caterpillar website, average of 4 pieces of equipment)
98 K = Mean number of days per with at least 0.01 inches of precipitation (from Panoche Junction COOP weather station Western Regional Climate Center)
0.457 PM10 lb/VMT

Equipment	Quantity	Hours/Day	Days/year	Miles travelled per hour	Watering Control Efficiency	PM10 Emissions (lb/hr)	PM10 Emissions (lb/day)	PM10 Emissions (tons/yr)	PM2.5 Emissions (lb/hr)	PM2.5 Emissions (lb/day)	PM2.5 Emissions (tons/yr)
Service Trucks	2	2	22	1	85%	0.14	0.27	0.00	0.03	0.06	0.00
Service Trucks will operate 2 hours at end of day, not during daily activities											
Backhoe	1	8	22	1	85%	0.07	0.55	0.01	0.01	0.12	0.00
Wheeled Dozer	1	8	22	1	85%	0.07	0.55	0.01	0.01	0.12	0.00
Water Truck	1	8	22	5	85%	0.34	2.74	0.03	0.07	0.58	0.01
Pipelayer	1	8	22	1	85%	0.07	0.55	0.01	0.01	0.12	0.00
					Total	**0.55**	**4.38**	**0.05**	**0.12**	**0.93**	**0.01**

Equipment weight from Caterpillar website (www.cat.com/cda)
Water efficiency from CEQA Table 11-4 watering 3 times daily or using chemical suppressants
PM2.5 emission factors from updated CEIDARS List with PM2.5 fractions.
PM2.5 numbers obtained by multiplying the PM10 values by fraction in CEIDARS list for appropriate fugitive dust sources.
Pipelayer is Crawler Tractor

Equipment	Weight (tons)	Caterpillar Model
Backhoe	11.78	430E
Wheeled Dozer	23.94	814F
Water Truck	13.00	
Pipelayer	18.58	561N
	67.30	**TOTAL**
	16.82	AVERAGE WT

Substation Expansion - Diesel Fired Equipment

Activity occurs in months 14 through 18 only (three months of overlap with building construction).

					Emission factors (lb/hr)						Hourly Emissions (lb/hr)						Daily Emissions (lb/day)						Annual Emissions (ton/yr)					
Equipment	**Quantity**	**Hours/Day**	**Horsepower**	**Days/year**	**PM10**	**PM2.5**	**CO**	**VOC**	**NOx**	**SOx**	**PM10**	**PM2.5**	**CO**	**VOC**	**NOx**	**SOx**	**PM10**	**PM2.5**	**CO**	**VOC**	**NOx**	**SOx**	**PM10**	**PM2.5**	**CO**	**VOC**	**NOx**	**SOx**
Loader	1	8	100	110	0.056	0.052	0.382	0.132	0.592	0.001	0.06	0.05	0.38	0.13	0.59	0.00	0.45	0.42	3.05	1.06	4.74	0.00	0.025	0.023	0.168	0.058	0.261	0.000
Backhoe	1	8	80	110	0.049	0.045	0.388	0.147	0.487	0.000	0.05	0.05	0.39	0.15	0.49	0.00	0.40	0.36	3.11	1.17	3.89	0.00	0.022	0.020	0.171	0.065	0.214	0.000
Hydraulic Lift	2	8	120	110	0.043	0.039	0.234	0.079	0.436	0.000	0.09	0.08	0.47	0.16	0.87	0.00	0.68	0.63	3.74	1.26	6.97	0.01	0.038	0.035	0.206	0.069	0.384	0.000
									Total		**0.19**	**0.18**	**1.24**	**0.44**	**1.95**	**0.00**	**1.53**	**1.41**	**9.90**	**3.49**	**15.61**	**0.01**	**0.08**	**0.08**	**0.54**	**0.19**	**0.86**	**0.00**

Notes:
Equipment list, quantity, horsepower, and hours of operation from EIFand Bibb
Emission factors from CARB Off-road Mobile Source Emission Factors (2006-2020). (2007 data used). Values presented are scaled to match the HP presented.
PM2.5 emission factors from updated CEIDARS List with PM2.5 fractions. PM2.5 numbers obtained by multiplying the PM10 values by fraction in CEIDARS list for onroad or offroad diesel vehicles.
Hydraulic Lift is Forklift

MODEL EMISSION RATE INPUTS (pounds per hour)

CO 1-HR	CO 8-HR	NOx 1-HR	NOx Annual
0.62	0.62	0.98	0.0980

PM10 24-HR	PM10 Ann	PM2.5 24-H	PM2.5 Annual
0.10	0.0096	0.09	0.0088

Minor differences between inputs and calculated values are due to rounding differences.
(2 volume sources)

SO2 1-HR	SO2 3-HR	SO2 24-HR	SO2 Annual
9.17E-04	9.17E-04	9.17E-04	9.21E-05

Travel on unpaved road

Activity occurs in months 14 through 18 only.

$F = 2.1 * G/12 * H/30 * (J/3)^{0.7} * (I/4)^{0.5} * (365-K)/365$ SCAQMD Table A9-9-D

Emission factor for vehicle travel on unpaved roads (lb/VMT)

16 G = Surface silt loading (%) (from Table A9-9-D-1 for farm road)
5 H = Mean vehicle speed (mph)
4 I = Mean number of wheels on vehicle (from Table A9-9-D-3)
6.78 J = Mean vehicle weight (ton) (average from equipment listed below)
98 K = Mean number of days per with at least 0.01 inches of precipitation (from Panoche Junction COOP weather station Western Regional Climate Center)
0.604 PM10 lb/VMT

Equipment	Quantity	Hours/Day	Days/year	Miles travelled per hour	Watering Control Efficiency	PM10 Emissions (lb/hr)	PM10 Emissions (lb/day)	PM10 Emissions (tons/yr)	PM2.5 Emissions (lb/hr)	PM2.5 Emissions (lb/day)	PM2.5 Emissions (tons/yr)
Service Trucks	2	2	110	1	85%	0.18	0.36	0.02	0.04	0.08	0.00
Service Trucks will operate 2 hours at end of day, not during daily activities											
Loader	1	6	110	5	85%	0.45	2.72	0.15	0.10	0.58	0.03
Backhoe	1	6	110	1	85%	0.09	0.54	0.03	0.02	0.12	0.01
Hydraulic Lift	1	8	110	5	85%	0.45	3.62	0.20	0.10	0.77	0.04
					Total	**1.00**	**6.89**	**0.38**	**0.21**	**1.46**	**0.08**

Equipment weight from Caterpillar website (www.cat.com/cda)
Water efficiency from CEQA Table 11-4 watering 3 times daily or using chemical suppressants
PM2.5 emission factors from updated CEIDARS List with PM2.5 fractions.
PM2.5 numbers obtained by multiplying the PM10 values by fraction in CEIDARS list for appropriate fugitive dust sources.

Equipment	Weight (tons)	Caterpillar Model
Loader	6.64	908
Backhoe	11.78	430E
Hydraulic Lift	7.74	TH330B
	33.90	**TOTAL**
	6.78	**AVERAGE**

MODEL EMISSION RATE INPUTS (pounds per hour)

PM10 24-Hl	PM10 Annu	PM2.5 24-H	PM2.5 Annual
0.861	0.086	0.182	0.018

Minor differences between inputs and calculated values are due to rounding differences.

Panoche Energy Center
Wastewater Injection Well – Diesel Engine Characterization[1]

Overall Duration:	10 to 14 days per well, two wells total
Drawworks:	5 to 9 days, 24-hours per day 750 HP diesel engine ½ time full load ½ time idling
Generators:	Two @ 200 HP diesel engines Operate for the complete duration
Mud Pumps:	Two @ 500 HP diesel engines Operate 10 to 24 hours
Cement Truck:	One @ 400 HP diesel Operates for 4 hours
Loging Truck:	One @ 300 HP diesel Operates for 6 to 8 hours

[1] Rig type and engine emissions will vary depending on the rig selected and the specific well construction methods of the selected contractor.

12/21/06, Rev 1 Page 1 of 1 File M:2006027\construction

Panoche Energy Center
Water Supply Wells – Engine Characterization[1]

Overall Duration:	60 to 70 days per well, two wells total
Drill Rig:	40 to 50 days, 24-hours per day One 500 HP diesel engine
Air Compressors:	One @ 200 HP diesel engine Operates for the complete duration, 24 hr/day
Generator:	One @ 25 HP diesel engine Operate for the complete duration, at night only
Cement Truck:	Ten truckloads @ 400 HP diesel Cementing takes 1 day only
Water Pump:	One @ 120 HP diesel Operate for 5 days
Welder:	One @ 25 HP diesel Operates for 48 hours over the duration
Pump Test Rig:	One @ 500 HP diesel Operates for 7 to 10 days, daytime only

[1] Rig type and engine emissions will vary depending on the rig selected and the specific well construction methods of the selected contractor.

12/21/06, Rev 0 Page 1 of 1 File M:2006027\construction

Panoche Energy Center					
Power Block Conetruction -Engine Characterization					
12/20/06, Rev 1					
Activity	Type of Equipment (Quantity)	Engine Horsepower	Max No. of heavy vehicle trips	Vehicle Miles Traveled	Assumed roundtrip location
1) Clearing and Grubbing					
	Wheel Loader (1)	500	NA	NA	NA
Overall Duration: 1 month	Chipper (1)	100	NA	NA	NA
	Dump Truck	300	67	133	within 1 mile
	Track Dozer (1)	500	NA	NA	NA
2) Civil Work (overex, rough grading and pond construction, fill import)					
	Motor Grader (1)	220	NA	NA	NA
Overall Duration: 2 months	Scaper (1)	460	NA	NA	NA
	Wheel Loader (1)	500	NA	NA	NA
	Compactor (1)	150	NA	NA	NA
	Dump Truck (fill import)	400	1,400	50,000	within 15 miles
	Track Dozer (1)	500	NA	NA	NA
	Water Truck (1)	250	NA	NA	NA
3) Concrete Pours (Foundations)					
	8 CY Concrete Truck	400	1,050	105,000	Fresno
Piling Duration: 2 months	Boom Pumper Truck (1)	400	NA	NA	NA
Foundation Pours: 8 months	Delivery Truck for Reinforcing Steel	400	21	2,110	Fresno
	Diesel Hammer -Pile Driver (1)	1.5 gal/hr	NA	NA	NA
	Delivery Truck for Piles	400	18	1,754	Fresno
	Crane (2)	500	NA	NA	NA
4) Natural Gas Pipeline					
	Backhoe Loader (1)	100	NA	NA	NA
Overall Duration: 1 month	Pipelayer (1)	150	NA	NA	NA
	Wheel Dozer (1)	400	NA	NA	NA

EMISSION CALCULATIONS FOR ONROAD HEAVY DUTY VEHICLES

EMISSION FACTOR FOR ONROAD VEHICLES

Onroad Vehicle	Fuel Type	Vehicle Count	Weight (lbs)	Vehicle Type	EF (lbs/VMT) [1]				
					TOC	CO	NOx	PM10	SO2
TREE REMOVAL - Dump Truck	D	1	46000	HHD	1.72E-03	6.45E-03	3.08E-02	6.45E-04	2.15E-05
EARTH TRANSPORT - Dump Truck	D	2	46000	HHD	1.72E-03	6.45E-03	3.08E-02	6.45E-04	2.15E-05
CONCRETE DELIVERIES - Heavy Duty Delivery Truck	D	2	28000	HHD	1.72E-03	6.45E-03	3.08E-02	6.45E-04	2.15E-05

1. To obtain the emission factors, EMFAC2002 was run in the "planning inventory" mode for the modeling year of 2007. The San Benito County average fleet information was chosen, and the inventory was run for winter. The emission factor for a given vehicle category was back calculated using the daily emissions and daily VMT for that vehicle category.

EMISSION CALCULATION FOR ONROAD VEHICLES

Onroad Vehicles[1]	Total Days[2]	Total Trips / Activity	Total Trips / Day	Round Trip	Daily Total VMT	Daily Emissions (lbs)					Project Emissions (lbs)				
						TOC	CO	NOx	PM10	SO2	TOC	CO	NOx	PM10	SO2
TREE REMOVAL - Dump Truck	22	67	3	30	91.4	1.57E-01	5.89E-01	2.81E+00	5.89E-02	1.96E-03	3.46E+00	1.30E+01	6.18E+01	1.30E+00	4.32E-02
EARTH TRANSPORT - Dump Truck	44	1,400	32	10	318.2	5.47E-01	2.05E+00	9.78E+00	2.05E-01	6.84E-03	2.41E+01	9.03E+01	4.31E+02	9.03E+00	3.01E-01
CONCRETE DELIVERIES - Heavy Duty Delivery Truck	176	1050	6	100	596.6	1.03E+00	3.85E+00	1.83E+01	3.85E-01	1.28E-02	1.81E+02	6.77E+02	3.23E+03	6.77E+01	2.26E+00
Total					**Total**	**1.73 lbs**	**6.49 lbs**	**30.94 lbs**	**0.65 lbs**	**0.02 lbs**	**208.19 lbs**	**780.71 lbs**	**3721.38 lbs**	**78.07 lbs**	**2.60 lbs**
											0.10	**0.39**	**1.86**	**0.04**	**0.0 tons**

1. Based on equipment usage as given for each respective phase:
Tree Removal - Clear & Grubb Phase
Earth Transport - Grading Phase
Concrete Deliveries - Building Phase
2. Total Days based on 5 days/week, 22 days/month schedule

FUGITIVE EMISSIONS FROM VEHICLE TRAFFIC ON PAVED ROAD

Vehicle Type	Mean Vehicles Speed (mph) [Vehicles Weight (tons)]	Total No. Of Trips / Day	PM10 EF (lbs/VMT) [1]	Round Trip Distance (mile)	Daily Total VMT (all units)	Total No. of Days Operated	VMT/ Project	Daily Emissions (lbs)	Project Emissions (lbs)
TREE REMOVAL - Dump Truck	[23]	3	0.0792	30	91.4	22	2,010	7.24	159.22
EARTH TRANSPORT - Dump Truck	[23]	32	0.0792	10	318.2	44	14,000	25.20	1109.00
CONCRETE DELIVERIES - Heavy Duty Delivery Truck	[14]	6	0.0634	100	596.6	176	105,000	37.80	6652.31
Total								**70**	**7,921**

1. EF are calculated using equations in AP-42, Section 13.2.2. Equation 1a is used for heavy duty trucks.
EF calculations are based on the following assumptions:

Paved road silt content (%)	0.1348			SCAQMD CEQA Table A-9-C-1, 5% local, 5% collector, 90% freeway
Silt Loading	0.04	oz/yr^2	1.356	g/m^2 SCAQMD CEQA Table A9-9-C-1.

Title : San Benito County Avg 2007 Winter Default Title
Version : Emfac2002 V2.2 Apr 23 2003
Run Date : 01/04/07 11:58:42
Scen Year: 2007 -- Model Years: 1965 to 2007
Season : Winter
Area : San Benito County Average
I/M Stat : I and M program in effect
Emissions: Tons Per Day
****

Dump And Delivery Trucks

	HHDT-NCAT	HHDT-CAT	HHDT-DSL
Vehicles	8	42	536
VMT/1000	0	4	93
Trips	362	1917	2713

Total Organic Gas Emissions			
Run Exh	0	0.02	0.08
Idle Exh	0	0	0.01
Start Ex	0.01	0.02	0
Total Ex	0.01	0.03	0.08
Diurnal	0	0	0
Hot Soak	0	0	0
Running	0	0.01	0
Resting	0	0	0
Total	0.02	0.04	0.08
EF (lbs/VMT)			**0.00172043**

Carbon Monoxide Emissions			
Run Exh	0.08	0.23	0.28
Idle Exh	0	0	0.03
Start Ex	0.12	0.29	0
Total Ex	0.2	0.51	0.3
EF (lbs/VMT)			**0.006451613**

Oxides of Nitrogen Emissions			
Run Exh	0	0.06	1.35
Idle Exh	0	0	0.08
Start Ex	0	0.02	0
Total Ex	0.01	0.09	1.43
EF (lbs/VMT)			**0.030752688**

Carbon Dioxide Emissions (000)			
Run Exh	0	0	0.22
Idle Exh	0	0	0
Start Ex	0	0	0
Total Ex	0	0	0.23
EF (lbs/VMT)			**0.004946237**

PM10 Emissions			
Run Exh	0	0	0.03
Idle Exh	0	0	0
Start Ex	0	0	0
Total Ex	0	0	0.03
TireWear	0	0	0
BrakeWr	0	0	0
Total	0	0	0.03
EF (lbs/VMT)			**0.000645161**

Lead	0	0	0
		SOx	0.001
EF (lbs/VMT)			**0.0000215054**
Fuel Consumption (000 gallons)			
Gasoline	0.05	0.33	0
Diesel	0	0	20.47

```
1 2 20 6 30423          ! Number of scenarios in file, version info
San Benito County Avg 2007 Winter Default Title ! Scenario Title
Burden   8  2          ! Program mode TOG  PM10
2007                   ! Calendar Year
14                     ! Month/Season
 4                     ! Geographic area selection: San Benito County
35                     ! County Number
FFFFF                  ! WEIGHT Output Options
FFFTF                  ! EMFAC Output Options
TTTFF                  ! BURDEN Output Options
FTFFF                  ! CALIMFAC Output Options
FFFFF                  ! EMFACnn Output Options
25                     ! First hour printed for detailed Burden output
6 1                    ! Bag and correction for Calimfac output
1965                   ! First model year considered in calculations
2007                   ! Last model year considered in calculations

                       ! Data on I/M Programs
                       ! --------------------
 3                     ! Number of I/M programs (num_prog) in scenario  1
17                     ! Area used for I/M basis: San Benito (NCC)
 3  1 1992             ! Subprograms, start month, and start year for I/M program  1
 2 2 2                 ! Inspection frequency (1=Annual, 2=Biennial)
 1 1 2                 ! Test method
 3 3 3                 ! Visual/Functional checks
 2 2 2                 ! Exhaust Cutpoint Stringency
 2 2 2                 ! Repair Cost
 2 2 2                 ! Mechanic Inspection Effectiveness
 0  0  0               ! Minimum vehicle age
45 45 45               ! Maximum vehicle age
1966 1966 1980         ! Minimum model year
2040 1979 2040         ! Maximum model year
 1 1 1                 ! Free years
 0 0 0                 ! Years to skip
 2 2 2                 ! Mechanic Repair Effectiveness
 1 1 1                 ! Evap test: 1 => None, 2 => Gas Cap, 3 => Pressure-purge
0.17 0.17 0.17         ! Change of ownership percentage
0.00 0.00 0.00         ! Annual % vehs captured by random roadside program
0.00 0.00 0.00         ! Annual % vehs captured by remote sensing program
0.00 0.00 0.00         ! Annual % vehs captured by tamper detection program
 0  0  0               ! Years of annual inspections for a gross polluter
 0  0  0               ! Zero if high-emitter profile is not used
 F  F  F               ! True if bad exhaust text algorithm is used
 T  T  T               ! True if ARB's OBD II assumptions are used for OBD II vehicles
 F  T  T               ! All PCs  included in program [Yes(T) or No(F)]
 F  T  T               ! All LDT  included in program [Yes(T) or No(F)]
 F  T  T               ! All MDV  included in program [Yes(T) or No(F)]
 T  F  F               ! All HDGV included in program [Yes(T) or No(F)]
 F  F  F               ! All HDDV included in program [Yes(T) or No(F)]
 F  F  F               ! All MCs  included in program [Yes(T) or No(F)]
                       ! Tech groups (if any) in subprogram.
1  7 1996              ! Subprograms, start month, and start year for I/M program  2
2                      ! Inspection frequency (1=Annual, 2=Biennial)
2                      ! Test method
3                      ! Visual/Functional checks
3                      ! Exhaust Cutpoint Stringency
2                      ! Repair Cost
2                      ! Mechanic Inspection Effectiveness
 0                     ! Minimum vehicle age
45                     ! Maximum vehicle age
1966                   ! Minimum model year
2040                   ! Maximum model year
1                      ! Free years
0                      ! Years to skip
2                      ! Mechanic Repair Effectiveness
1                      ! Evap test: 1 => None, 2 => Gas Cap, 3 => Pressure-purge
0.17                   ! Change of ownership percentage
0.00                   ! Annual % vehs captured by random roadside program
0.00                   ! Annual % vehs captured by remote sensing program
0.00                   ! Annual % vehs captured by tamper detection program
 0                     ! Years of annual inspections for a gross polluter
 0                     ! Zero if high-emitter profile is not used
 F                     ! True if bad exhaust text algorithm is used
 T                     ! True if ARB's OBD II assumptions are used for OBD II vehicles
 T                     ! All PCs  included in program [Yes(T) or No(F)]
 T                     ! All LDT  included in program [Yes(T) or No(F)]
 T                     ! All MDV  included in program [Yes(T) or No(F)]
 T                     ! All HDGV included in program [Yes(T) or No(F)]
 F                     ! All HDDV included in program [Yes(T) or No(F)]
 F                     ! All MCs  included in program [Yes(T) or No(F)]
                       ! Tech groups (if any) in subprogram.
2  6 1998              ! Subprograms, start month, and start year for I/M program  3
2 2                    ! Inspection frequency (1=Annual, 2=Biennial)
2 2                    ! Test method
3 3                    ! Visual/Functional checks
3 3                    ! Exhaust Cutpoint Stringency
3 3                    ! Repair Cost
2 2                    ! Mechanic Inspection Effectiveness
 0  0                  ! Minimum vehicle age
30 30                  ! Maximum vehicle age
1974 1974              ! Minimum model year
2040 2040              ! Maximum model year
4 4                    ! Free years
0 0                    ! Years to skip
2 2                    ! Mechanic Repair Effectiveness
2 2                    ! Evap test: 1 => None, 2 => Gas Cap, 3 => Pressure-purge
0.17 0.17              ! Change of ownership percentage
0.00 0.00              ! Annual % vehs captured by random roadside program
0.00 0.00              ! Annual % vehs captured by remote sensing program
0.00 0.00              ! Annual % vehs captured by tamper detection program
 0  0                  ! Years of annual inspections for a gross polluter
 0  0                  ! Zero if high-emitter profile is not used
 F  F                  ! True if bad exhaust text algorithm is used
 T  T                  ! True if ARB's OBD II assumptions are used for OBD II vehicles
 F  T                  ! All PCs  included in program [Yes(T) or No(F)]
 F  T                  ! All LDT  included in program [Yes(T) or No(F)]
 F  T                  ! All MDV  included in program [Yes(T) or No(F)]
 T  F                  ! All HDGV included in program [Yes(T) or No(F)]
 F  F                  ! All HDDV included in program [Yes(T) or No(F)]
 F  F                  ! All MCs  included in program [Yes(T) or No(F)]
                       ! Tech groups (if any) in subprogram.
#
```

Title : San Benito County Avg 2007 Winter Default Title
Version : Emfac2002 V2.2 Apr 23 2003
Run Date : 01/04/07 11:58:42
Scen Year: 2007 -- Model Years: 1965 to 2007
Season : Winter
Area : San Benito County Average
I/M Stat : I and M program in effect
Emissions: Tons Per Day

	Light Duty Passenger Cars				Light Duty Trucks				Medium Duty Trucks				Heavy Duty Trucks - Gasoline				Heavy Duty Trucks - Diesel	Total HD	Urban	Motor-	All
	Non-cat	Cat	Diesel	Total	Non-cat	Cat	Diesel	Total	Non-cat	Cat	Diesel	Total	Non-cat	Cat	Total		Trucks	Trucks	Buses	cycles	Vehicles
Vehicles	372.	20585.	101.	21059.	431.	16864.	465.	17760.	66.	3988.	354.	4407.	94.	724.	817.		1081.	1899.	37.	1691.	46853.
VMT/1000	5.	789.	3.	796.	7.	634.	14.	655.	1.	172.	22.	194.	1.	19.	21.		127.	147.	5.	16.	1814.
Trips	1532.	130035.	580.	132148.	1827.	106013.	2850.	110691.	547.	45994.	3928.	50469.	2387.	7870.	10256.		15232.	25489.	148.	3382.	322326.
Total Organic Gas Emissions																					
Run Exh	0.04	0.13	0.00	0.17	0.05	0.14	0.00	0.19	0.01	0.04	0.01	0.06	0.01	0.03	0.04		0.09	0.13	0.01	0.08	0.64
Idle Exh	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.01	0.01	0.00	0.00	0.01
Start Ex	0.01	0.14	0.00	0.16	0.01	0.14	0.00	0.15	0.01	0.05	0.00	0.06	0.04	0.03	0.07		0.00	0.07	0.00	0.01	0.46
Total Ex	0.05	0.27	0.00	0.33	0.07	0.28	0.00	0.34	0.01	0.10	0.01	0.12	0.06	0.06	0.12		0.10	0.21	0.01	0.09	1.11
Diurnal	0.00	0.01	0.00	0.01	0.00	0.01	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00	0.02
Hot Soak	0.01	0.02	0.00	0.03	0.01	0.02	0.00	0.03	0.00	0.00	0.00	0.01	0.00	0.00	0.00		0.00	0.00	0.00	0.00	0.06
Running	0.04	0.11	0.00	0.15	0.02	0.15	0.00	0.18	0.00	0.04	0.00	0.05	0.01	0.02	0.04		0.00	0.04	0.00	0.01	0.42
Resting	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00	0.01
Total	0.09	0.41	0.00	0.51	0.10	0.46	0.00	0.56	0.02	0.15	0.01	0.18	0.07	0.08	0.16		0.10	0.25	0.01	0.11	1.62
Carbon Monoxide Emissions																					
Run Exh	0.47	2.60	0.00	3.07	0.68	3.09	0.01	3.78	0.16	0.68	0.03	0.88	0.31	0.46	0.77		0.36	1.13	0.08	1.09	10.03
Idle Exh	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.01	0.00	0.00	0.00		0.03	0.03	0.00	0.00	0.04
Start Ex	0.06	1.53	0.00	1.58	0.07	1.70	0.00	1.77	0.03	0.57	0.00	0.60	0.26	0.54	0.81		0.00	0.81	0.01	0.04	4.81
Total Ex	0.52	4.13	0.00	4.66	0.74	4.79	0.01	5.55	0.19	1.26	0.03	1.49	0.57	1.00	1.58		0.39	1.97	0.09	1.13	14.88
Oxides of Nitrogen Emissions																					
Run Exh	0.03	0.36	0.00	0.39	0.04	0.49	0.02	0.55	0.01	0.17	0.12	0.30	0.01	0.11	0.12		1.71	1.83	0.03	0.03	3.13
Idle Exh	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.09	0.09	0.00	0.00	0.09
Start Ex	0.00	0.08	0.00	0.09	0.00	0.10	0.00	0.10	0.00	0.08	0.00	0.08	0.00	0.04	0.05		0.00	0.05	0.00	0.00	0.31
Total Ex	0.03	0.44	0.00	0.47	0.04	0.59	0.02	0.65	0.01	0.25	0.12	0.38	0.01	0.15	0.16		1.80	1.96	0.04	0.03	3.53
Carbon Dioxide Emissions (000)																					
Run Exh	0.00	0.32	0.00	0.32	0.00	0.31	0.01	0.32	0.00	0.14	0.01	0.15	0.00	0.01	0.02		0.28	0.29	0.01	0.00	1.10
Idle Exh	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00	0.00
Start Ex	0.00	0.01	0.00	0.01	0.00	0.01	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00	0.03
Total Ex	0.00	0.33	0.00	0.33	0.00	0.33	0.01	0.33	0.00	0.14	0.01	0.15	0.00	0.01	0.02		0.28	0.30	0.01	0.00	1.13
PM10 Emissions																					
Run Exh	0.00	0.01	0.00	0.01	0.00	0.01	0.00	0.01	0.00	0.00	0.00	0.01	0.00	0.00	0.00		0.04	0.04	0.00	0.00	0.07
Idle Exh	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00	0.00
Start Ex	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00	0.00
Total Ex	0.00	0.01	0.00	0.01	0.00	0.01	0.00	0.01	0.00	0.00	0.00	0.01	0.00	0.00	0.00		0.04	0.04	0.00	0.00	0.07
TireWear	0.00	0.01	0.00	0.01	0.00	0.01	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00	0.02
BrakeWr	0.00	0.01	0.00	0.01	0.00	0.01	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00	0.03
Total	0.00	0.03	0.00	0.03	0.00	0.03	0.00	0.03	0.00	0.01	0.00	0.01	0.00	0.00	0.00		0.04	0.05	0.00	0.00	0.12
Lead	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00	0.00
SOx	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00	0.01

Fuel Consumption (000 gallons)

Gasoline	0.39	34.29	0.00	34.68	0.56	34.14	0.00	34.70	0.12	14.73	0.00	14.85	0.26	1.68	1.94	0.00	1.94	0.31	0.44	86.92
Diesel	0.00	0.00	0.09	0.09	0.00	0.00	0.48	0.48	0.00	0.00	1.08	1.08	0.00	0.00	0.00	25.48	25.48	0.41	0.00	27.54

Title : San Benito County Avg 2007 Winter Default Title
Version : Emfac2002 V2.2 Apr 23 2003
Run Date : 01/04/07 11:58:42
Scen Year: 2007 -- Model Years: 1965 to 2007
Season : Winter
Area : San Benito County Average
I/M Stat : I and M program in effect
Emissions: Tons Per Day

	- - - Light Duty Trucks 1 (T1) - - -				- - - Light Duty Trucks 2 (T2) - - -				- - - Medium Duty Trucks (T3) - - -				- Light-Heavy Duty Trucks 1 (T4) - -				- Light-Heavy Duty Trucks 2 (T5) - -				- Medium-Heavy Duty Trucks (T6) - -				HH Duty	School Buses		Urban Buses		Total
	Non-cat	Cat	Diesel	Total	Non-cat	Cat	Diesel	Total	Non-cat	Cat	Diesel	Total	Non-cat	Cat	Diesel	Total	Non-cat	Cat	Diesel	Total	Non-cat	Cat	Diesel	Total	Diesel Trks	Gas	Diesel	Gas	Diesel	Buses
Vehicles	266.	9680.	376.	10322.	165.	7184.	89.	7438.	57.	3207.	83.	3347.	9.	688.	158.	855.	0.	92.	112.	204.	82.	674.	498.	1254.	536.	12.	47.	25.	12.	96.	
VMT/1000	4.	364.	11.	379.	3.	270.	3.	276.	1.	119.	3.	123.	0.	47.	12.	59.	0.	6.	7.	12.	1.	15.	31.	47.	93.	1.	2.	3.	2.	8.	
Trips	1122.	60685.	2300.	64108.	705.	45328.	550.	46583.	253.	20185.	528.	20966.	294.	22756.	1991.	25042.	0.	3052.	1408.	4460.	2007.	5923.	12331.	20261.	2713.	47.	188.	99.	49.	382.	

Total Organic Gas Emissions

Run Exh	0.03	0.08	0.00	0.11	0.02	0.06	0.00	0.08	0.01	0.04	0.00	0.05	0.00	0.00	0.01	0.01	0.00	0.00	0.00	0.01	0.01	0.01	0.01	0.03	0.08	0.00	0.00	0.01	0.00	0.01	
Idle Exh	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	
Start Ex	0.01	0.08	0.00	0.09	0.01	0.06	0.00	0.07	0.00	0.04	0.00	0.04	0.00	0.01	0.00	0.02	0.00	0.00	0.00	0.00	0.03	0.01	0.00	0.05	0.00	0.00	0.00	0.00	0.00	0.00	
Total Ex	0.04	0.15	0.00	0.20	0.03	0.12	0.00	0.15	0.01	0.08	0.00	0.09	0.00	0.02	0.01	0.03	0.00	0.00	0.00	0.01	0.04	0.03	0.01	0.08	0.08	0.00	0.00	0.01	0.00	0.02	
Diurnal	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Hot Soak	0.01	0.01	0.00	0.02	0.00	0.01	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Running	0.02	0.09	0.00	0.11	0.01	0.06	0.00	0.07	0.00	0.03	0.00	0.03	0.00	0.01	0.00	0.01	0.00	0.00	0.00	0.00	0.01	0.01	0.00	0.02	0.00	0.00	0.00	0.00	0.00	0.00	
Resting	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Total	0.06	0.26	0.00	0.32	0.04	0.20	0.00	0.23	0.01	0.11	0.00	0.13	0.01	0.03	0.01	0.04	0.00	0.01	0.00	0.01	0.05	0.04	0.01	0.11	0.08	0.00	0.00	0.01	0.00	0.02	

Carbon Monoxide Emissions

Run Exh	0.42	1.82	0.01	2.25	0.26	1.27	0.00	1.53	0.15	0.62	0.00	0.77	0.02	0.04	0.02	0.08	0.00	0.02	0.01	0.03	0.18	0.21	0.07	0.47	0.28	0.06	0.01	0.08	0.00	0.15	
Idle Exh	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.00	0.00	0.00	0.00	0.00	
Start Ex	0.04	0.98	0.00	1.02	0.03	0.72	0.00	0.75	0.01	0.40	0.00	0.42	0.01	0.14	0.00	0.15	0.00	0.03	0.00	0.03	0.14	0.26	0.00	0.40	0.00	0.01	0.00	0.01	0.00	0.01	
Total Ex	0.46	2.80	0.01	3.27	0.28	1.99	0.00	2.28	0.16	1.02	0.00	1.19	0.03	0.19	0.02	0.23	0.00	0.06	0.01	0.07	0.32	0.47	0.08	0.87	0.30	0.07	0.01	0.09	0.00	0.17	

Oxides of Nitrogen Emissions

Run Exh	0.02	0.24	0.02	0.28	0.01	0.25	0.00	0.27	0.01	0.15	0.01	0.16	0.00	0.02	0.07	0.09	0.00	0.00	0.04	0.05	0.00	0.04	0.33	0.38	1.35	0.00	0.03	0.01	0.02	0.07	
Idle Exh	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.08	0.00	0.00	0.00	0.00	0.00	
Start Ex	0.00	0.04	0.00	0.04	0.00	0.06	0.00	0.06	0.00	0.03	0.00	0.03	0.00	0.04	0.00	0.04	0.00	0.01	0.00	0.01	0.00	0.02	0.00	0.02	0.00	0.00	0.00	0.00	0.00	0.00	
Total Ex	0.03	0.28	0.02	0.33	0.02	0.30	0.00	0.32	0.01	0.18	0.01	0.19	0.00	0.06	0.07	0.13	0.00	0.01	0.05	0.06	0.01	0.06	0.34	0.41	1.43	0.00	0.04	0.01	0.02	0.07	

Carbon Dioxide Emissions (000)

Run Exh	0.00	0.18	0.00	0.19	0.00	0.13	0.00	0.14	0.00	0.08	0.00	0.08	0.00	0.05	0.01	0.06	0.00	0.01	0.00	0.01	0.00	0.01	0.05	0.06	0.22	0.00	0.00	0.00	0.00	0.01	
Idle Exh	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Start Ex	0.00	0.01	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Total Ex	0.00	0.19	0.00	0.19	0.00	0.14	0.00	0.14	0.00	0.08	0.00	0.09	0.00	0.05	0.01	0.06	0.00	0.01	0.00	0.01	0.00	0.01	0.05	0.06	0.23	0.00	0.00	0.00	0.00	0.01	

PM10 Emissions

Run Exh	0.00	0.00	0.00	0.01	0.00	0.01	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.01	0.03	0.00	0.00	0.00	0.00	0.00	
Idle Exh	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Start Ex	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Total Ex	0.00	0.01	0.00	0.01	0.00	0.01	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.01	0.03	0.00	0.00	0.00	0.00	0.00	
TireWear	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
BrakeWr	0.00	0.01	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Total	0.00	0.01	0.00	0.01	0.00	0.01	0.00	0.01	0.00	0.01	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.01	0.03	0.00	0.00	0.00	0.00	0.00	
Lead	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
SOx	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	

Fuel Consumption (000 gallons)

Gasoline	0.34	19.58	0.00	19.92	0.21	14.56	0.00	14.78	0.10	8.78	0.00	8.88	0.02	5.31	0.00	5.33	0.00	0.64	0.00	0.64	0.18	1.31	0.00	1.49	0.00	0.06	0.00	0.31	0.00	0.37	
Diesel	0.00	0.00	0.37	0.37	0.00	0.00	0.10	0.10	0.00	0.00	0.11	0.11	0.00	0.00	0.63	0.63	0.00	0.00	0.35	0.35	0.00	0.00	4.66	4.66	20.47	0.00	0.34	0.00	0.41	0.76	

TECHNICAL AREA: AIR QUALITY

Data Request 13 Rev: Please describe how much of the surface soils will need to be removed, and how much will have to be excavated and recompacted, and describe the final disposal for the removed soils.

Response:

Exporting of soils from the site will not be required. Plant drainage will work with a plant elevation of 411 feet. The amount of fill that will need to be imported from borrow areas is roughly 30,000 cubic yards (cy) instead of 60,000 cy.

TECHNICAL AREA: AIR QUALITY

Data Request 14 Rev: Please identify if these notations provide "smaller than 200" sieve percentages based on actual sieve results or are visual estimates, or whether they note something else entirely.

Response:

The "-200" numbers are the percentage of materials that pass through a 200 mesh screen, which is generally considered the mesh that defines the break point for fine grain materials (i.e., silt and/or clay). The reported percentages were determined by actual tests. The test methods utilized and the meaning of the data presented in the soil bore logs are explained in Appendix B of the Geotechnical report.

TECHNICAL AREA: AIR QUALITY

Data Request 15 Rev: Please provide the equipment and fugitive dust assumptions for both the pipeline and substation construction phases and indicate whether either of these two construction activities would overlap the schedule for other onsite construction activities.

Response:

A new Excel workbook with separate spreadsheets showing the equipment exhaust and fugitive dust emissions estimates for each construction activity has been prepared in lieu of the previous URBEIS2002 model calculations. The spreadsheets are notated to document the sources of emission factors and assumptions used in developing the emissions estimates. Please see the revised spreadsheets provided in the response to Data Request 12, the revised spreadsheets replace those originally presented in Appendix I, Attachment B of the AFC.

TECHNICAL AREA: AIR QUALITY

Data Request 16 Rev: Please confirm that emulsified diesel is proposed for construction, or revise the URBEMIS modeling runs appropriately.

Response:

As noted in previous responses, the construction emissions have been recalculated using spreadsheets, rather than URBEMIS, and South Coast AQMD emission factors recommended by CEC, which do not assume the use of emulsified diesel fuel.

TECHNICAL AREA: AIR QUALITY

Data Request 17 Rev: Please provide an appropriate correction for the fugitive dust mitigation efficiency overestimate by URBEMIS considering the applicant's proposed fugitive dust mitigation measures.

Response:

As described in previous responses, pollutant emissions for all construction activities have been recalculated using a different approach. Please see the revised spreadsheets provided in the response to Data Request 12, the revised spreadsheets replace those originally presented in Appendix I, Attachment B of the AFC. The spreadsheets clearly show the level of dust control assumed for each activity. In most cases, an 85% reduction in dust emissions was credited for watering the site at least three times daily or applying chemical dust suppressants on disturbed bare areas.

TECHNICAL AREA: AIR QUALITY

Data Request 18 Rev: Please review all of the modeling inputs, correct as necessary based on this request and other applicable data requests using URBEMIS or an alternative more site specific emission estimating approach and resubmit the construction emission estimates.

Response:

A new Excel workbook with separate spreadsheets showing the equipment exhaust and fugitive dust emissions estimates for each construction activity has been prepared in lieu of the previous URBEIS2002 model calculations. The spreadsheets are notated to document the sources of emission factors and assumptions used in developing the emissions estimates. Please see the revised spreadsheets provided in the response to Data Request 12, the revised spreadsheets replace those originally presented in Appendix I, Attachment B of the AFC.

TECHNICAL AREA: AIR QUALITY

Data Request 19 Rev: To confirm these estimates, please identify the maximum number of daily heavy vehicle trips and VMT for these three construction peak periods and the total number of heavy vehicle trips, by type and assumed round trip locations, needed for all construction activities.

Response:

The revised construction emissions tables in the revised Appendix I, Attachment B spreadsheets provided in the response to Data Request 12, show the emissions associated with heavy duty vehicle trips. Specifically emissions for these trips may be seen on the spreadsheets for Clearing and Grubbing, Site Grading and Facility Building (which includes concrete pouring). The table below presents the requested information regarding these heavy vehicle trips.

Estimated Heavy Vehicle Trips Associated with Specific PEC Construction Activities

Activity	Duration (months)	Engine Horsepower/Cubic Yards	Maximum Heavy Vehicle Trips for Activity	Assumed Two-Way Trip Distance (miles)	Total Vehicle Miles	Vehicle Miles per Day*
Tree Removal	1	300/15	67	30	2,010	91.4
Earth Transport	2	400/15	1,667	30	50,010	1,136.6
Concrete Deliveries	8	400/8	1,050	100	105,000	596.6

* Daily miles estimated based on 22 work days per month

TECHNICAL AREA: AIR QUALITY

Data Request 20 Rev: Please identify the final disposal option that will be used for the pomegranate trees removed from the site. If that option will create emissions concurrent to the project construction or operation (such as stockpiling, drying and later burning onsite) please provide an estimate of the tree waste disposal action emissions.

Response:

Current plans are for the uprooted trees to be processed in a chipper at the PEC site and subsequently loaded into trucks and delivered to a biomass plant to be used as fuel. There will be no extended stockpiling or burning of trees or chips on the site. The distance from the PEC site to the biomass plant is about 15 miles.

TECHNICAL AREA: AIR QUALITY

Data Request 21 Rev: Please provide a PM2.5 emission estimate for construction. For engine emissions please either assume 100% of engine particulate emissions are PM2.5 or use approved California Air Resources Board (CARB) California Emission Inventory Development and Reporting System (CEIDARS) particulate size speciation profiles. For fugitive dust emissions please use approved CEIDARS particulate size speciation profiles.

Response:

The revised emission calculations presented in the revised Appendix I, Attachment B spreadsheets provided in the response to Data Request 12 include PM2.5 emissions estimates for fugitive dust and exhaust sources based on the CEIDARS data base.

TECHNICAL AREA: AIR QUALITY

Data Request 22 Rev: Please rerun the model using appropriate hourly emission factors for the hours in the day assumed for construction and provide revised results. Also as noted previously please combine receptors and meteorological files to reduce the number of modeling runs by a factor of ten.

Response:

Dispersion model runs have been made incorporating all of the changes to construction emission sources that are discussed in the responses to previous data requests.

As described in Response No. 12, The PEC construction effort will be comprised of a number of separate activities occurring at different times over an 18-month period. Each phase of construction will require different numbers and sizes of construction equipment operating at different locations within the PEC site. Thus it is not obvious which activity would be likely to produce the highest offsite concentrations of air pollutants. Accordingly, several different candidate scenarios were modeled to ensure that worst-case impacts would in fact be addressed. Experience shows that the pollutants and averaging times that are generally most important for construction emissions in California are: one-hour NO2 concentrations and 24-hour PM10/PM2.5 concentrations; therefore scenarios that would maximize potential offsite impacts for these values were chosen. The main criteria for selecting these modeling scenarios were magnitude of estimated emissions, activity duration and proximity of emission sources to the PEC site boundary. The three selected scenarios are:

- Site Grading (Months 5 and 6)

- Injection Well Installation (Month 1)

- Site Building with Overlapping Substation Expansion Construction (Month 14 – 18).

For each scenario, short-term impacts were modeled using the largest equipment grouping (in terms of potential emissions) that would be expected to cause the highest emissions on the same day. All construction activities, except well drilling, were assumed to occur during an 8-hour day. Calculation of annual emissions assumed all construction activities that would occur over a 12-month period.

The results of the revised modeling are summarized in the Revised Table 5.2-18A below. Full electronic copies of the construction phase modeling input/output files are provided on an accompanying DVD along with the operational modeling files referenced in the response to Data Request No. 4.

Table 5.2-18A (Revised) (1st of 3 Parts)
Maximum Modeled Criteria Pollutant Impacts due to PEC Construction Emissions

Pollutant	Averaging Period	Maximum Modeled Impact (µg/m³)	PSD Significant Impact Level[1] (µg/m³)	Background[2] (µg/m³)	Maximum Total Predicted Concentration (µg/m³)	Most Stringent AAQS (µg/m³)	UTM Coordinates	
							East (m)	North (m)
Construction Impacts – Injection Well Installation								
CO	1 hour	536.1	NA	7,705	8,241	23,000	716,189	4,058,631
	8 hour	246.3	NA	5,156	5,402	10,000	716,189	4,058,631
NO_2	1 hour[3]	193.9[3]	NA	169.2	363.1[3]	470	716,189	4,058,631
	Annual	1.48	NA	42.0	43.5	100	716,214	4,058,606
PM_{10}	24 hour	34.46	NA	193.0 [4]	227.46	50	716,189	4,058,631
	Annual	0.14	NA	43.0 [4]	43.14	20	716,189	4,058,631
$PM_{2.5}$	24 hour	11.1	NA	110.0 [4]	121.1	65	716,189	4,058,631
	Annual	0.07	NA	21.6 [4]	21.67	12	716,214	4,058,606
SO_2	1 hour	1.39	NA	23.6	24.99	655	716,189	4,058,631
	3 hour	0.81	NA	15.6	16.41	1,300	716,173	4,058,652
	24 hour	0.22	NA	10.5	10.72	105	716,239	4,058,581
	Annual	0.002	NA	5.3	5.302	80	716,214	4,058,606

[1] Source: 40 CFR 52.21

[2] Background represents the maximum values measured at Fresno First St. (CO, NO_2, PM_{10}, $PM_{2.5}$) or Fresno Fremont School (SO_2) monitoring stations, 2001-2005

[3] Results for 1-hour NO_2 during construction used ozone limiting method (OLM) to estimate NO_2 impacts. Ozone measurement at Hanford monitoring station for the same hour of meteorological data as maximum predicted 1-hour NOx concentration (1/17/89 hour 9) was used in the OLM calculation

[4] PM_{10} and $PM_{2.5}$ background levels exceed ambient standards.

Table 5.2-18A (Revised) (2nd of 3 Parts)
Maximum Modeled Criteria Pollutant Impacts due to PEC Construction Emissions

Pollutant	Averaging Period	Maximum Modeled Impact (µg/m³)	PSD Significant Impact Level[1] (µg/m³)	Background[2] (µg/m³)	Maximum Total Predicted Concentration (µg/m³)	Most Stringent AAQS (µg/m³)	UTM Coordinates	
							East (m)	North (m)
Construction Impacts – Site Grading								
CO	1 hour	579.3	NA	7,705	8,284	23,000	715,865	4,058,740
	8 hour	265.2	NA	5,156	5,667	10,000	715,958	4,058,791
NO_2	1 hour[3]	184.8[3]	NA	169.2	354.0[3]	470	715,865	4,058,740
	Annual	1.54	NA	42.0	43.54	100	716,106	4,058,530
PM_{10}	24 hour	49.2	NA	193.0 [4]	242.2	50	715,864	4,058,789
	Annual	0.93	NA	43.0 [4]	43.93	20	716,174	4,058,604
$PM_{2.5}$	24 hour	17.32	NA	110.0 [4]	127.32	65	715,864	4,058,789
	Annual	0.16	NA	21.6 [4]	21.76	12	716,165	4,058,580
SO_2	1 hour	1.29	NA	23.6	24.89	655	715,865	4,058,740
	3 hour	0.78	NA	15.6	16.38	1,300	715,865	4,058,765
	24 hour	0.22	NA	10.5	10.72	105	716,012	4,058,527
	Annual	0.001	NA	5.3	5.30	80	716,106	4,058,530

[1] Source: 40 CFR 52.21

[2] Background represents the maximum values measured at Fresno First St. (CO, NO_2, PM_{10}, $PM_{2.5}$) or Fresno Fremont School (SO_2) monitoring stations, 2001-2005

[3] Results for 1-hour NO2 during construction used ozone limiting method (OLM) to estimate NO_2 impacts. Ozone measurement at Hanford monitoring station for the same hour of meteorological data as maximum predicted 1-hour NOx concentration (11/29/89 hour 16) was used in the OLM calculation

[4] PM_{10} and $PM_{2.5}$ background levels exceed ambient standards.

Table 5.2-18A (Revised) (3rd of 3 Parts)
Maximum Modeled Criteria Pollutant Impacts due to PEC Construction Emissions

Pollutant	Averaging Period	Maximum Modeled Impact (µg/m³)	PSD Significant Impact Level[1] (µg/m³)	Background[2] (µg/m³)	Maximum Total Predicted Concentration (µg/m³)	Most Stringent AAQS (µg/m³)	UTM Coordinates	
							East (m)	North (m)
Concurrent Site Building and Substation Expansion								
CO	1 hour	1,114.8	NA	7,705	8,820	23,000	715,865	4,058,740
	8 hour	870.2	NA	5,156	6,026	10,000	715,958	4,058,791
NO_2	1 hour[3]	290.4[3]	NA	169.2	459.6[3]	470	715,865	4,058,740
	Annual	11.89	NA	42.0	53.89	100	716,106	4,058,530
PM_{10}	24 hour	46.27	NA	193.0 [4]	239.27	50	715,864	4,058,789
	Annual	1.27	NA	43.0 [4]	44.27	20	716,289	4,058,781
$PM_{2.5}$	24 hour	18.97	NA	110.0 [4]	128.97	65	715,865	4,058,765
	Annual	0.66	NA	21.6 [4]	22.26	12	715,981	4,058,791
SO_2	1 hour	4.69	NA	23.6	28.29	655	715,839	4,058,681
	3 hour	2.35	NA	15.6	17.95	1,300	715,867	4,058,668
	24 hour	0.69	NA	10.5	11.19	105	715,865	4,058,765
	Annual	.011	NA	5.3	5.31	80	715,981	4,058,791

[1] Source: 40 CFR 52.21

[2] Background represents the maximum values measured at Fresno First St. (CO, NO_2, PM_{10}, $PM_{2.5}$) or Fresno Fremont School (SO_2) monitoring stations, 2001-2005

[3] Results for 1-hour NO_2 during construction used ozone limiting method (OLM) to estimate NO_2 impacts. Ozone measurement at Hanford monitoring station for the same hour of meteorological data as maximum predicted 1-hour NO_x concentration (12/04//90 hour 8) was used in the OLM calculation

[4] PM_{10} and $PM_{2.5}$ background levels exceed ambient standards.

TECHNICAL AREA: AIR QUALITY

Data Request 23 Rev: Please provide the NOx_OLM input/output files, including ozone input files, if NOx_OLM was used, or provide the simplified OLM calculations and assumptions if that method was used to determine worst case 1-hour NOx impacts. Please note that other modeling corrections may be necessary based on the previous data request and the other data requests regarding construction emission estimates.

Response:

The ozone limiting method was applied to the predicted maximum one-hour ozone concentrations during construction. NOx OLM with sequential ozone input data could not be used because that model only works properly with point source emission input data, whereas certain construction sources, such as exhaust from moving equipment within the site, are more appropriately represented as volume sources. Accordingly, a simple hand calculation was made to estimate the portion of the maximum predicted 1-hour NOx concentrations for each modeled construction activity that would be converted to NO2. The hourly ozone data used for this purpose was the value recorded at the Hanford monitoring station for the same hour of the meteorological input data record that produced the highest NOx concentration in ISCST3. As described in Response No. 24, separate modeling was conducted for several different tasks (scenarios) that were selected to ensure that maximum off-site pollutant concentrations would be addressed.

Among the different candidate construction scenarios modeled, the highest predicted hourly NOx concentration (2,712 µg/m3) occurred for Site Building with Substation Expansion. This value was predicted to occur with the meteorological input data for December 4, 1991. The ozone concentration recorded at Hanford during this hour was 10 parts per billion or 0.01 parts per million (20 µg/m3). The ozone limiting calculation is:

$$[NO_2]_{ann} = \{(0.1) \times [NO_x]_{pred}\} + MIN\{(0.9) \times [NO_x]_{pred}, \text{ or } (46/48) \times [O_3]_{bkgd}\}$$

where

$[NO_2]_{ann}$ is the predicted annual NO_2 concentration
$[NO_x]_{pred}$ is the model predicted annual NO_x concentration
MIN means the minimum of the two quantities within the brackets
$[O_3]_{bkgd}$ is the representative annual average ambient O3 concentration
(46/48) is the molecular weight of NO_2 divided by the molecular weight of O_3

Substituting the values obtained for December 4, 1991 yields a project NO2 impact of 290.4 µg/m^3. When this is added to the conservative background NO_2 concentration of 169.2 µg/m^3 used throughout the modeling analyses, the resulting total concentration is 459.6 µg/m^3.

TECHNICAL AREA: AIR QUALITY

Data Request 24 Rev: Please provide corrected modeling runs or provide corrections for the modeling file names when not rerun as necessary to respond to other data requests.

Response:

Revised construction modeling input/output files are provided electronically on the DVD that accompanies these Data Request responses.

TECHNICAL AREA: AIR QUALITY

Data Request 25 Rev: Please provide a copy of the District's correspondence regarding existing and planned cumulative projects located within six miles of the PEC site.

Response:

During a meeting with SJVAPCD on January 4, 2007, the following District "PAS Listing" was provided to PEC. Note that the proposed PEC and Starwood facilities are not on this list. The District contact is:

Mr. Leland Villalvazo
Supervising Air Quality Specialist
(559) 230-5881 tel
(559) 230-6061 fax
Leland.villalvazo@valleyair.org

The PAS Listing follows:

PAS LISTING

County: 10 Region: C Facility ID: 213
UTMZ: 10 UTME: 722.59 UTMN: 4063.48 SPHEROID: WGS84 DATUM: NAD83

FacilityName: EAGLE VALLEY GINNING, LLC
Faciliity Type: COTTON GINNING
Facility Name: EAGLE VALLEY GINNING LLC
Address1: 39936 W NORTH AVE
Address2:
City: MENDOTA
State: CA Zip: 93640

Distance To Location (m): 7551.68
Direction To Location(deg): 33.17
Accuracy:

County: 10 Region: C Facility ID: 290
UTMZ: 10 UTME: 712.16 UTMN: 4057.34 SPHEROID: WGS84 DATUM: NAD83

FacilityName: CHEVRON USA, INC. #92316
Faciliity Type: GASOLINE DISPENSING
Facility Name: CHEVRON USA, INC. #92316
Address1: 46330 W PANOCHE RD
Address2:
City: FIREBAUGH
State: CA Zip: 93622

Distance To Location (m): 4568.66
Direction To Location(deg): 205.98
Accuracy:

County: 10 Region: C Facility ID: 911
UTMZ: 10 UTME: 716.06 UTMN: 4063.38 SPHEROID: WGS84 DATUM: NAD83

FacilityName: PANOCHE GINNING CO
Faciliity Type: COTTON GINNING
Facility Name: PANOCHE GINNING CO
Address1: 43890 W NORTH AVE
Address2:
City: FIREBAUGH
State: CA Zip: 93622

Distance To Location (m): 4043.57
Direction To Location(deg): 356.97
Accuracy:

PAS LISTING

County: 10 Region: C Facility ID: 1124
UTMZ: 10 UTME: 713.18 UTMN: 4057.82 SPHEROID: DATUM:

FacilityName: WESTSIDE 76
Faciliity Type: GASOLINE DISPENSING
Facility Name: WESTSIDE 76
Address1: 46370 PANOCHE RD
Address2:
City: FIREBAUGH
State: CA Zip:

Distance To Location (m): 3444.89
Direction To Location(deg): 206.25
Accuracy: found by street

County: 10 Region: C Facility ID: 1256
UTMZ: 10 UTME: 711.78 UTMN: 4057.16 SPHEROID: WGS84 DATUM: NAD83

FacilityName: TRIPLE L LAND CO
Faciliity Type: SAND AND GRAVEL
Facility Name: TRIPLE L LAND CO
Address1: 46924 W PANOCHE RD
Address2:
City: FIREBAUGH
State: CA Zip: 93622

Distance To Location (m): 4993.35
Direction To Location(deg): 205.96
Accuracy:

County: 10 Region: C Facility ID: 1385
UTMZ: 10 UTME: 715.88 UTMN: 4063.38 SPHEROID: WGS84 DATUM: NAD83

FacilityName: ANDERSON CLAYTON CORP/SILVER C
Faciliity Type: COTTON GINNING
Facility Name: ANDERSON CLAYTON CORP/SILVER C
Address1: 43939 NORTH AVE
Address2:
City: FIREBAUGH
State: CA Zip: 93622

Distance To Location (m): 4053.41
Direction To Location(deg): 354.52
Accuracy:

PAS LISTING

County: 10 Region: C Facility ID: 1892
UTMZ: 10 UTME: 712.18 UTMN: 4057.34 SPHEROID: WGS84 DATUM: NAD83

FacilityName: M J EPPLER INC
Faciliity Type: GASOLINE DISPENSING
Facility Name: M J EPPLER INC
Address1: 46331 W PANOCHE RD
Address2:
City: FIREBAUGH
State: CA Zip:

Distance To Location (m): 4556.84
Direction To Location(deg): 206.17
Accuracy:

County: 10 Region: C Facility ID: 2974
UTMZ: 10 UTME: 722.60 UTMN: 4058.57 SPHEROID: DATUM:

FacilityName: DEPARTMENT OF FISH & GAME
Faciliity Type: WILDLIFE MANAGEMENT
Facility Name: DEPARTMENT OF FISH & GAME
Address1: 4333 S SANTA FE GRADE
Address2:
City: MENDOTA
State: CA Zip: 93640

Distance To Location (m): 6377.90
Direction To Location(deg): 96.99
Accuracy: found by zip code

County: 10 Region: C Facility ID: 3374
UTMZ: 10 UTME: 713.59 UTMN: 4058.00 SPHEROID: DATUM:

FacilityName: WEST VALLEY HULLING CO
Faciliity Type: AGRICULTURAL PRODUCTS PROCESSI
Facility Name: WEST VALLEY HULLING CO
Address1: 45475 W PANOCHE RD
Address2:
City: FIREBAUGH
State: CA Zip: 93622

Distance To Location (m): 2999.74
Direction To Location(deg): 206.62
Accuracy:

PAS LISTING

County: 10 Region: C Facility ID: 3811
UTMZ: 10 UTME: 716.27 UTMN: 4059.35 SPHEROID: WGS84 DATUM: NAD83

FacilityName: CAL PEAK POWER - PANOCHE, LLC
Faciliity Type: POWER GENERATION
Distance To Location (m): 0.00
Direction To Location(deg):
Accuracy:

Facility Name: CAL PEAK POWER - PANOCHE, LLC
Address1: 43699 WEST PANOCHE RD
Address2:
City: FIREBAUGH
State: CA Zip: 93622-9720

County: 10 Region: C Facility ID: 3844
UTMZ: 10 UTME: 715.98 UTMN: 4059.40 SPHEROID: WGS84 DATUM: NAD83

FacilityName: WELLHEAD POWER PANOCHE, LLC.
Faciliity Type: POWER GENERATION
Distance To Location (m): 291.02
Direction To Location(deg): 280.67
Accuracy:

Facility Name: WELLHEAD POWER PANOCHE, LLC.
Address1: 43649 W PANOCHE RD
Address2:
City: FIREBAUGH
State: CA Zip: 93622

County: 10 Region: C Facility ID: 4185
UTMZ: 10 UTME: 712.10 UTMN: 4057.40 SPHEROID: WGS84 DATUM: NAD83

FacilityName: PANOCHE MOBIL
Faciliity Type: GASOLINE DISPENSING
Distance To Location (m): 4602.52
Direction To Location(deg): 204.96
Accuracy:

Facility Name: PANOCHE MOBIL
Address1: 46365 PANOCHE
Address2:
City: FIREBAUGH
State: CA Zip: 93622

TECHNICAL AREA: AIR QUALITY

Data Request 26 Rev: Please provide the cumulative modeling analysis, including the nearby Calpeak and Wellhead Energy peaker sites as proposed in the modeling protocol, as well as all District identified cumulative sources and the recently proposed Starwood Power-Midway Peaking Project (06-AFC-10).

Response:

Contrary to PEC's prior understanding, the District stated at PEC's meeting with the District on January 4, 2007 that the District would not perform the cumulative modeling analysis because it is not required to do so. PEC is willing to provide this analysis via its consultant, but requests until January 18, 2007 in which to submit a final analysis to the CEC. This cumulative analysis will consider the significance and appropriate inclusion of emissions from facilities in the District's PAS Listing, along with those of the proposed PEC and Starwood projects.

TECHNICAL AREA: BIOLOGICAL RESOURCES

Data Request 27 Rev: Please provide any supporting documents (letter or record of conversation) that resulted from communication with USFWS and CDFG regarding potential impacts to the state and federally listed San Joaquin kit fox. Please provide contact information for the USFWS and CDFG staff.

Response:

California Department of Fish and Game
Julie Lance, Habitat Conservation Division
559-243-4014 x222

Conversation with Julie Lance on July 19, 2006. In the conversation, Julie Lance stated URS Biologists would not need to conduct protocol level surveys for San Joaquin kit fox since the habitat at the project site is not suitable for dens; however, Ms. Lance referred URS Biologists to guidelines on avoidance and minimization measures for San Joaquin kit fox foraging habitat found in "Standardized Recommendations for Protection of the San Joaquin Kit Fox Prior to or During Ground Disturbance" (Sacramento Fish & Wildlife Office, US Fish & Wildlife Service, 6/1999) located on the CDFG Habitat Conservation Planning Branch website (http:// www.dfg.ca.gov/hcpb/species/stds_gdl/survmonitr.shtml#MAMMALS). The guidelines were followed when preparing the biology section for the AFC and are attached, in its entirety, on the following pages. The record of the telephone conversation is also attached.

U.S. Fish and Wildlife Service
San Joaquin Valley Division
916-414-6630

Left a message on July 12, 2006 but calls were not returned.

U.S. FISH AND WILDLIFE SERVICE
STANDARDIZED RECOMMENDATIONS
FOR PROTECTION OF THE SAN JOAQUIN KIT FOX
PRIOR TO OR DURING GROUND DISTURBANCE

Prepared by the Sacramento Fish and Wildlife Office
June 1999

INTRODUCTION

The following document includes many of the San Joaquin kit fox (*Vulpes macrotis mutica*) protection measures typically recommended by the U. S. Fish and Wildlife Service (Service), prior to and during ground disturbance activities. However, incorporating relevant sections of these guidelines into the proposed project is not the only action required under the Endangered Species Act of 1973, as amended (Act). Project applicants should contact the Service in Sacramento to determine the full range of requirements that apply to your project; the address and telephone number are given at the end of this document. Formal authorization for the project may be required under either section 7 or section 10 of the Act. Implementation of the measures presented in this document may be necessary to avoid violating the provisions of the Act, including the prohibition against "take" (defined as killing, harming, or harassing a listed species, including actions that damage or destroy its habitat). Such protection measures may also be required under the terms of a biological opinion pursuant to section 7 of the Act resulting in incidental take authorization (authorization), or an incidental take permit (permit) pursuant to section 10 of the Act. The specific measures implemented to protect kit fox for any given project shall be determined by the Service based upon the applicant's consultation with the Service.

The purpose of this document is to make information on kit fox protection strategies readily available and to help standardize the methods and definitions currently employed to achieve kit fox protection. The measures outlined in this document are subject to modification or revision at the discretion of the Service.

All surveys, den destructions, and monitoring described in this document must be conducted by a qualified biologist. A qualified biologist (biologist) means any person who has completed at least four years of university training in wildlife biology or a related science and/or has demonstrated field experience in the identification and life history of the San Joaquin kit fox. In addition, biologist(s) must be able to identify coyote, red fox, gray fox, and kit fox tracks, and to have seen a kit fox in the wild, at a zoo, or as a museum mount.

SMALL PROJECTS

Small projects are considered to be those projects with small foot prints such as an individual in-fill oil well, communication tower, or bridge repair. These projects must stand alone and not be part of, or in any way connected to larger projects (i.e., bridge repair or improvement to serve a

future urban development). The Service recommends that on these small projects, the biologist survey the proposed project boundary and a 200-foot area outside of the project footprint to identify habitat features, and make recommendations on situating the project to minimize or avoid impacts. If habitat features cannot be completely avoided, then preconstruction surveys should be conducted.

Preconstruction/preactivity surveys shall be conducted no less than 14 days and no more than 30 days prior to the beginning of ground disturbance and/or construction activities or any project activity likely to impact the San Joaquin kit fox. Surveys should identify kit fox habitat features on the project site and evaluate use by kit fox and, if possible, and assess the potential impacts to the kit fox by the proposed activity. The status of all dens should be determined and mapped (see Survey Protocol).

Written results of preconstruction/preactivity surveys must be received by the Service within five days after survey completion and prior to the start of ground disturbance and/or construction activities. If a natal/pupping den is discovered within the project area or within 200-feet of the project boundary, the Service shall be immediately notified. If the preconstruction/preactivity survey reveals an active natal pupping or new information, the project applicant should contact the Service immediately to obtain the necessary take authorization/permit.

If take authorization/permit has already been issued, then the biologist may proceed with den destruction within the project boundary, except natal/pupping dens (active or inactive). Protective exclusion zones can be placed around all known and potential dens which occur outside the project footprint (conversely, the project boundary can be demarcated, see den destruction section).

OTHER PROJECTS

It is likely that all other projects occurring within kit fox habitat will require a take authorization/permit from the Service. This determination would be made by the Service during the early evaluation process (see Survey Protocol). These other projects would include, but are not limited to: linear projects; projects with large footprints such as urban development; and projects which in themselves may be small but have far reaching impacts (i.e., water storage or conveyance facilities that promote urban growth or agriculture, etc.).

The take authorization/permit issued by the Service may incorporate some or all of the protection measures presented in this document. The take authorization/permit may include measures specific to the needs of the project, and those requirements supersede any requirements found in this document.

EXCLUSION ZONES

The configuration of exclusion zones around the kit fox dens should have a radius measured outward from the entrance or cluster of entrances. The following radii are minimums, and if they cannot be followed the Service must be contacted:

Potential den	50 feet
Known den	100 feet
Natal/pupping den (occupied and unoccupied)	Service must be contacted
Atypical den	50 feet

Known den: To ensure protection, the exclusion zone should be demarcated by fencing that encircles each den at the appropriate distance and does not prevent access to the den by kit foxes. Exclusion zone fencing should be maintained until all construction related or operational disturbances have been terminated. At that time, all fencing shall be removed to avoid attracting subsequent attention to the dens.

Potential and Atypical dens: Placement of 4-5 flagged stakes 50 feet from the den entrance(s) will suffice to identify the den location; fencing will not be required, but the exclusion zone must be observed.

Construction and other project activities should be prohibited or greatly restricted within these exclusion zones. Only essential vehicle operation on existing roads and foot traffic should be permitted. Otherwise, all construction, vehicle operation, material storage, or any other type of surface-disturbing activity should be prohibited within the exclusion zones.

DESTRUCTION OF DENS

Disturbance to all San Joaquin kit fox dens should be avoided to the maximum extent possible. Protection provided by kit fox dens for use as shelter, escape, cover, and reproduction is vital to the survival of the species. Limited destruction of kit fox dens may be allowed, if avoidance is not a reasonable alternative, provided the following procedures are observed. The value to kit foxes of potential, known, and natal/pupping dens differ and therefore, each den type needs a different level of protection. **Destruction of any known or natal/pupping kit fox den requires take authorization/permit from the Service.**

Natal/pupping dens: Natal or pupping dens which are occupied will not be destroyed until the pups and adults have vacated and then only after consultation with the Service. Therefore, project activities at some den sites may have to be postponed.

Known Dens: Known dens occurring within the footprint of the activity must be monitored for three days with tracking medium or an infra-red beam camera to determine the current use. If no kit fox activity is observed during this period, the den should be destroyed immediately to preclude subsequent use. If kit fox activity is observed at the den during this period, the den should be monitored for at least five consecutive days from the time of the observation to allow any resident animal to move to another den during its normal activity. Use of the den can be discouraged during this period by partially plugging its entrances(s) with soil in such a manner that any resident animal can escape easily. Only when the den is determined to be unoccupied may the den be excavated under the direction of the biologist. If the animal is still present after five or more consecutive days of plugging and monitoring, the den may have to be excavated when, in the judgment of a biologist, it is temporarily vacant, for example during the animal's normal foraging activities. The Service encourages hand excavation, but realizes that soil conditions may necessitate the use of excavating equipment. However, extreme caution must be exercised.

Destruction of the den should be accomplished by careful excavation until it is certain that no kit foxes are inside. The den should be fully excavated, filled with dirt and compacted to ensure that kit foxes cannot reenter or use the den during the construction period. If at any point during excavation a kit fox is discovered inside the den, the excavation activity shall cease immediately and monitoring of the den as described above should be resumed. Destruction of the den may be completed when in the judgement of the biologist, the animal has escaped from the partially destroyed den.

Potential Dens: If a take authorization/permit has been obtained from the Service, den destruction may proceed without monitoring, unless other restrictions were issued with the take authorization/permit. If no take authorization/permit has been issued, then potential dens should be monitored as if they were known dens. If any den was considered to be a potential den, but is later determined during monitoring or destruction to be currently, or previously used by kit fox (e.g., if kit fox sign is found inside), then destruction shall cease and the Service shall be notified immediately.

CONSTRUCTION AND OPERATIONAL REQUIREMENTS

Habitat subject to permanent and temporary construction disturbances and other types of project-related disturbance should be minimized. Project designs should limit or cluster permanent project features to the smallest area possible while still permitting project goals to be achieved. To minimize temporary disturbances, all project-related vehicle traffic should be restricted to established roads, construction areas, and other designated areas. These areas should also be

included in preconstruction surveys and, to the extent possible, should be established in locations disturbed by previous activities to prevent further impacts.

1. Project-related vehicles should observe a 20-mph speed limit in all project areas, except on county roads and State and Federal highways; this is particularly important at night when kit foxes are most active. To the extent possible, night-time construction should be minimized. Off-road traffic outside of designated project areas should be prohibited.

2. To prevent inadvertent entrapment of kit foxes or other animals during the construction phase of a project, all excavated, steep-walled holes or trenches more than 2 feet deep should be covered at the close of each working day by plywood or similar materials, or provided with one or more escape ramps constructed of earth fill or wooden planks. Before such holes or trenches are filled, they should be thoroughly inspected for trapped animals. If at any time a trapped or injured kit fox is discovered, the procedures under number 13 of this section must be followed.

3. Kit foxes are attracted to den-like structures such as pipes and may enter stored pipe becoming trapped or injured. All construction pipes, culverts, or similar structures with a diameter of 4-inches or greater that are stored at a construction site for one or more overnight periods should be thoroughly inspected for kit foxes before the pipe is subsequently buried, capped, or otherwise used or moved in any way. If a kit fox is discovered inside a pipe, that section of pipe should not be moved until the Service has been consulted. If necessary, and under the direct supervision of the biologist, the pipe may be moved once to remove it from the path of construction activity, until the fox has escaped.

4. All food-related trash items such as wrappers, cans, bottles, and food scraps should be disposed of in closed containers and removed at least once a week from a construction or project site.

5. No firearms shall be allowed on the project site.

6. To prevent harassment, mortality of kit foxes or destruction of dens by dogs or cats, no pets should be permitted on project sites.

7. Use of rodenticides and herbicides in project areas should be restricted. This is necessary to prevent primary or secondary poisoning of kit foxes and the depletion of prey populations on which they depend. All uses of such compounds should observe label and other restrictions mandated by the U.S. Environmental Protection Agency, California Department of Food and Agriculture, and other State and Federal legislation, as well as additional project-related restrictions deemed necessary by the Service. If rodent control

must be conducted, zinc phosphide should be used because of proven lower risk to kit fox.

8. A representative shall be appointed by the project proponent who will be the contact source for any employee or contractor who might inadvertently kill or injure a kit fox or who finds a dead, injured or entrapped individual. The representative will be identified during the employee education program. The representative's name and telephone number shall be provided to the Service.

9. An employee education program should be conducted for any project that has expected impacts to kit fox or other endangered species. The program should consist of a brief presentation by persons knowledgeable in kit fox biology and legislative protection to explain endangered species concerns to contractors, their employees, and military and agency personnel involved in the project. The program should include the following: a description of the San Joaquin kit fox and its habitat needs; a report of the occurrence of kit fox in the project area; an explanation of the status of the species and its protection under the Endangered Species Act; and a list of measures being taken to reduce impacts to the species during project construction and implementation. A fact sheet conveying this information should be prepared for distribution to the above-mentioned people and anyone else who may enter the project site.

10. Upon completion of the project, all areas subject to temporary ground disturbances, including storage and staging areas, temporary roads, pipeline corridors, etc. should be re-contoured if necessary, and revegetated to promote restoration of the area to pre-project conditions. An area subject to "temporary" disturbance means any area that is disturbed during the project, but that after project completion will not be subject to further disturbance and has the potential to be revegetated. Appropriate methods and plant species used to revegetate such areas should be determined on a site-specific basis in consultation with the Service, California Department of Fish and Game (CDFG), and revegetation experts.

11. In the case of trapped animals, escape ramps or structures should be installed immediately to allow the animal(s) to escape, or the Service should be contacted for advice.

12. Any contractor, employee, or military or agency personnel who inadvertently kills or injures a San Joaquin kit fox shall immediately report the incident to their representative. This representative shall contact the CDFG immediately in the case of a dead, injured or entrapped kit fox. The CDFG contact for immediate assistance is State Dispatch at (916) 445-0045. They will contact the local warden or biologist.

13. The Sacramento Fish and Wildlife Office and CDFG will be notified in writing within three working days of the accidental death or injury to a San Joaquin kit fox during

project related activities. Notification must include the date, time, and location of the incident or of the finding of a dead or injured animal and any other pertinent information. The Service contact is the Chief of the Division of Endangered Species, at the addresses and telephone numbers given below. The CDFG contact is Mr. Ron Schlorff at 1416 9th Street, Sacramento, California 95814, (916) 654-4262.

Any project-related information required by the Service or questions concerning the above conditions or their implementation may be directed in writing to the U.S. Fish and Wildlife Service at:

Endangered Species Division
2800 Cottage Way, Suite W2605
Sacramento, California 95825-1846
(916) 414-6620

"Take" - Section 9 of the Endangered Species Act of 1973, as amended (Act) prohibits the "take" of any federally listed endangered species by any person (an individual, corporation, partnership, trust, association, etc.) subject to the jurisdiction of the United States. As defined in the Act, take means " . . . to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or attempt to engage in any such conduct." Thus, not only is a listed animal protected from activities such as hunting, but also from actions that damage or destroy its habitat.

"Dens" - San Joaquin kit fox dens may be located in areas of low, moderate, or steep topography. Den characteristics are listed below, however, the specific characteristics of individual dens may vary and occupied dens may lack some or all of these features. Therefore, caution must be exercised in determining the status of any den. Typical dens may include the following: (1) one or more entrances that are approximately 5 to 8 inches in diameter; (2) dirt berms adjacent to the entrances; (3) kit fox tracks, scat, or prey remains in the vicinity of the den; (4) matted vegetation adjacent to the den entrances; and (5) manmade features such as culverts, pipes, and canal banks.

"Known den" - Any existing natural den or manmade structure that is used or has been used at any time in the past by a San Joaquin kit fox. Evidence of use may include historical records, past or current radiotelemetry or spotlighting data, kit fox sign such as tracks, scat, and/or prey remains, or other reasonable proof that a given den is being or has been used by a kit fox. The Service discourages use of the terms "active" and "inactive" when referring to any kit fox den because a great percentage of occupied dens show no evidence of use, and because kit foxes change dens often, with the result that the status of a given den may change frequently and abruptly.

"Potential Den" - Any subterranean hole within the species' range that has entrances of appropriate dimensions for which available evidence is insufficient to conclude that it is being used or has been used by a kit fox. Potential dens shall include the following: (1) any suitable subterranean hole; or (2) any den or burrow of another species (e.g., coyote, badger, red fox, or ground squirrel) that otherwise has appropriate characteristics for kit fox use.

"Natal or Pupping Den" - Any den used by kit foxes to whelp and/or rear their pups. Natal/pupping dens may be larger with more numerous entrances than dens occupied exclusively by adults. These dens typically have more kit fox tracks, scat, and prey remains in the vicinity of the den, and may have a broader apron of matted dirt and/or vegetation at one or more entrances. A natal den, defined as a den in which kit fox pups are actually whelped but not necessarily reared, is a more restrictive version of the pupping den. In practice, however, it is difficult to distinguish between the two, therefore, for purposes of this definition either term applies.

"Atypical Den" - Any manmade structure which has been or is being occupied by a San Joaquin kit fox. Atypical dens may include pipes, culverts, and diggings beneath concrete slabs and buildings.

TELEPHONE CONVERSATION RECORD

URS

COPIES TO:

130 Robin Hill Road, Ste. 100, Santa Barbara,
California 93117
805.964-6010 FAX 805.964.0259

DATE	July 19, 2006	TIME	9 am
TO	Julie Lance	FROM	Johanna LaClaire
COMPANY	California Department of Fish and Game Habitat Conservation Planning Branch		
ADDRESS	1416 Ninth St., Sacramento, CA 95814	PHONE NO.	559-243-4014 x222
PROJ NAME	Panoche AFC	PROJ/TASK NO.	28906795.00030

Spoke with Julie Lance on July 19, 2006. She said we would not need to conduct protocol level surveys for San Joaquin kit fox since the habitat at the project site is not suitable for dens; however, she referred me to guidelines on avoidance and minimization measures for San Joaquin kit fox foraging habitat found in "Standardized Recommendations for Protection of the San Joaquin Kit Fox Prior to or During Ground Disturbance" (Sacramento Fish & Wildlife Office, US Fish & Wildlife Service, 6/1999) located on the CDFG Habitat Conservation Planning Branch website (http://www.dfg.ca.gov/hcpb/species/stds_gdl /survmonitr.shtml#MAMMALS). These guidelines were followed when preparing the biology section for the AFC (see attached).

TECHNICAL AREA: CULTURAL RESOURCES

Data Request 28 Rev: If off-site disposal and borrow sites are not commercial operations and consequently have not been surveyed for cultural resources, please conduct such surveys and provide the personnel qualifications, methods, and findings to staff.

Response:

The off-site disposal and borrow sites have not yet been determined, and will be determined immediately prior to construction. Borrow will come from a commercial operator and site. Soil to be removed from the site has been analyzed for pesticides and determined to be non-hazardous. (See WM-60.) As such, soils removed from the site prior to placement of borrow will be reused as topsoil in yet-to-be determined nearby agricultural settings.

TECHNICAL AREA: CULTURAL RESOURCES

Data Request 29 Rev: Please provide a map showing both proposed natural gas pipeline routes and a detailed description (with depth and width measurements) for the alternate route.

Response:

The primary route that will be used for the natural gas pipeline is described in PEC AFC Section 3.7.1 and shown on Figure 3.2-1. The only alternate is if the line may be installed on the north side of Panoche Road instead of the south side. The alternative route that was originally shown in the AFC Figure 3.4-1 will not be used by PG&E.

The pipeline trench is expected to be 18 inches wide and 48 inches deep.

TECHNICAL AREA: CULTURAL RESOURCES

Data Request 30 Rev: If the Panoche Substation is 45 years of age or older, please have a qualified architectural historian complete Department of Parks and Recreation (DPR) 523 "Primary" and "Building, Structure, and Object" forms, including an evaluation of significance. Please have the qualified architectural historian also assess the project's potential impact on the substation, and provide the DPR 523 forms and impact assessment.

Response:

Background research was conducted by JRP Historical Consulting Services for the proposed project. The background research included a history of the region and the project area, specifically focusing on the construction history, from the California State Library, Sacramento; U.C. Davis and U.C. Berkeley libraries; California State University East Bay; and the Fresno Historical Society. In addition, an on-site inventory of the existing structures and other built resources within and adjacent to the PEC and laydown area was conducted. According to the background research, no resources were found to be eligible for the National Register of Historic Places (NRHP) or the California Register of Historic Resources (CRHR). Furthermore, during the course of research, JRP Historical Consulting Services found no additional information to suggest that the Panoche Substation was in any way significant, therefore evaluation was unnecessary. The substation is a relatively recent facility and was not located or found on earlier historical maps.

TECHNICAL AREA: CULTURAL RESOURCES

Data Request 31 Rev: To verify that they have no concerns regarding cultural resources in the PEC project area, please telephone those Native American individuals or groups who have not yet responded to the informational letters that were sent out and provide summaries of the calls.

Response:

Attempts had been made to contact all members of the Native American community prior to the creation of the draft AFC. Although there were six individuals listed by the NAHC as contacts, these individuals are represented, and are contacted through, three organizations. The three organizations are the Santa Rosa Rancheria, Table Mountain Rancheria, and the Chaushiha Tribe. When these organizations and individuals were contacted by telephone, URS Staff was directed to the cultural resources department or specialist to discuss the project.

The letters describing the project and maps of the site and various components were sent on May 9, 2006 via certified mail, to the six contacts identified by the Native American Heritage Commission as appropriate for Fresno County. The letters inquired whether the groups/individuals had any concerns regarding the project, or wished to provide input regarding cultural resources in the project area.

A fax was received from Mr. Brian Austin, Tribal Attorney of the Chaushiha Tribe, on June 5, 2006. In this faxed letter, Mr. Austin stated that the Chaushiha Tribal Council was not, at the time, aware of any specific cultural significance of the proposed site. However, in the event that any resources are found, Mr. Austin requested that the tribe be notified.

Subsequent to the mailed letters, URS Archaeological Staff contacted the Table Mountain Rancheria on June 30, 2006. At that time, a representative of the Cultural Resources office stated that the Table Mountain Rancheria had no concerns regarding the project.

A follow-up call was also made to the Santa Rosa Rancheria on June 30, 2006 and URS staff was notified by Mr. Lalo Franco of the Cultural Resources Office that there may be some concerns regarding a nearby village site for which the Southern San Joaquin Valley Information Center did not have a site record. On July 7, 2006, an email was received from Mr. Franco stating that the village was, in fact, some distance from the project site, and that there were no further concerns regarding the project area.

The list of Native American organizations as provided by the Native American Heritage Commission, dated May 4, 2006 is attached on the following pages.

STATE OF CALIFORNIA Arnold Schwarzenegger, Governor

NATIVE AMERICAN HERITAGE
COMMISSION
915 CAPITOL MALL, ROOM 364
SACRAMENTO, CA 95814
(916) 653-4082
Fax (916) 657-5390

May 4, 2006

Christine K. Hacking
Senior Archaeologist
URS Corporation

Sent by Fax: 510-874-3268
Number of Pages: 2

RE: Proposed Panoche Energy Center PG& E Power project, Chaney Ranch, Fresno County.

Dear Ms. Hacking:

A record search of the sacred lands file has failed to indicate the presence of Native American cultural resources in the immediate project area. The absence of specific site information in the sacred lands file does not indicate the absence of cultural resources in any project area. Other sources of cultural resources should also be contacted for information regarding known and recorded sites.

Enclosed is a list of Native Americans individuals/organizations who may have knowledge of cultural resources in the project area. The Commission makes no recommendation or preference of a single individual, or group over another. This list should provide a starting place in locating areas of potential adverse impact within the proposed project area. I suggest you contact all of those indicated, if they cannot supply information, they might recommend others with specific knowledge. If a response has not been received within two weeks of notification, the Commission requests that you follow-up with a telephone call to ensure that the project information has been received.

If you receive notification of change of addresses and phone numbers from any of these individuals or groups, please notify me. With your assistance we are able to assure that our lists contain current information. If you have any questions or need additional information, please contact me at (916) 653-4040.

Sincerely,

Rob Wood
Environmental Specialist III

05/04/2006 16:35 FAX 916 657 5390 NAHC 002

Native American Contacts
Fresno County
May 3, 2006

Santa Rosa Rancheria
Clarence Atwell, Chairperson
P.O. Box 8 Tache
Lemoore , CA 93245 Tachi
(559) 924-1278 Yokut
(559) 924-3583 Fax

Table Mountain Rancheria
John Goodfellow, Environmental Coordinator
P.O. Box 410 Yokuts
Friant , CA 93626-0177
(559) 822-2587
(559) 822-2693 FAX

Table Mountain Rancheria
Lee Ann Walker Grant, Chairperson
P.O. Box 410 Yokuts
Friant , CA 93626-0177
(559) 822-2587
(559) 822-2693 FAX

Chaushiha Tribe
Jerry Brown
10553 N. Rice Road North Valley Yokuts
Fresno , CA 93720
559-434-3160

Table Mountain Rancheria
Michael Russell, Tribal Administrator
P.O. Box 410 Yokuts
Friant , CA 93626-0177
(559) 822-2587
(559) 822-2693 FAX

Table Mountain Rancheria
Bob Pennell, Cultural Resources Director
P.O. Box 410 Yokuts
Friant , CA 93626-0177
(559) 822-2587
(559) 822-2693 FAX

This list is current only as of the date of this document.

Distribution of this list does not relieve any person of statutory responsibility as defined in Section 7050.5 of the Health and Safety Code, Section 5097.94 of the Public Resources Code and Section 5097.98 of the Public Resources Code.

This list is only applicable for contacting local Native Americans with regard to cultural for the proposed * Panoche Energy Center PG&E Power Project, Chaney Ranch, Fresno County.

TECHNICAL AREA: CULTURAL RESOURCES

Data Request 32 Rev: Please provide copies of any additional letters received from Native Americans since the AFC was compiled and a summary of the telephone call made to the Table Mountain Rancheria representative on June 30, 2006. If the location of archaeological sites may be revealed, please provide the responses under confidential cover.

Response:

No additional letters have been received from the Native American community, nor have any additional phone calls been received.

TECHNICAL AREA: CULTURAL RESOURCES

Data Request 33 Rev: For the project region, please provide a map (at a scale of 1:24,000) showing the greatest extent of former Lake Tulare and its tributaries, and please mark on this map the location of the proposed PEC plant site.

Response:

A map at 1:24,000 scale would be too large to show the extent of the former Lake Tulare and its tributaries. As per a voicemail message from Beverly E. Bastion of the California Energy Commission, on December 21st, 2006, a map at a larger scale to show the full extent of the lake was prepared. Refer to Figure 1, Regional Location Map on the following page.

Map Placeholder

TECHNICAL AREA: GEOLOGICAL HAZARDS AND RESOURCES

Data Request 34 Rev: Please provide the balance of the text omitted from Section 5.3.1.1.10.

Response:

The balance of the text was inadvertently omitted from the Application for Certification. The last paragraph of Section 5.3.1.1.10 should have read:

"No specific countywide assessments to identify liquefaction hazards have been performed. Ground accelerations must approach 0.3g before liquefaction occurs in a sandy soil with relative densities typical of San Joaquin alluvial deposits. Areas subject to 0.3g acceleration or greater are located along the Coast Range foothills, but depth to ground water in these areas is typically great enough to minimize liquefaction potential (Fresno County, 2000). Recent soil borings drilled at the site did not encounter ground water to the maximum depths explored of 65 feet below ground surface. As discussed in Section 5.3.1.1.3, the depth to ground water is expected to be around 195 feet below ground surface. The depth to groundwater makes liquefaction at the site unlikely."

Liquefaction occurs only in saturated soils, and liquefaction susceptibility decreases with increasing groundwater depth. The generation of excess pore pressure under undrained loading conditions is a prerequisite for liquefaction phenomena (Kramer, 1996). The depth to ground water in a new, on-site monitoring well completed within the upper, semi-confined aquifer after submittal of the Application for Certification was approximately 175 feet below ground surface in December, 2006. The depth to groundwater makes liquefaction at the site unlikely.

TECHNICAL AREA: GEOLOGICAL HAZARDS AND RESOURCES

Data Request 35 Rev: Please clarify what value of peak horizontal ground acceleration is appropriate for this site.

Response:

Discrepancies between the Geological Hazards and Resources section and the preliminary geotechnical investigation report included as Appendix L of the Application for Certification occurred because the section was completed before the appendix. In addition, the peak site acceleration values provided in Section 5.3.1.1.8 are based on deterministic seismic hazard assessment and the Appendix L Peak Horizontal Ground Accelerations (PHGA) values are based on probabilistic seismic hazard assessment (PSHA). The seismic hazard assessment summarized in the preliminary geotechnical investigation report supersedes the assessment summarized in Section 5.3.1.1.8 of the Application for Certification. The estimated PHGA with a 10 percent probability of exceedance in 50 years at the PEC Site is approximately 0.48g (recurrence interval of 475 years). This level of ground motion is considered the Design Basis Earthquake (DBE) for the project.

TECHNICAL AREA: GEOLOGICAL HAZARDS AND RESOURCES

Data Request 36 Rev: Please clarify this discrepancy, and describe what impact this settlement may have on the operation of the proposed facilities, and how such impacts will be mitigated.

Response:

Discrepancies between the Geological Hazards and Resources section and the preliminary geotechnical investigation report included as Appendix L of the Application for Certification occurred because the section was completed before the appendix. Geotechnical investigation of the PEC Site identified loose, unsaturated granular soil layers that could result in some seismic-induced settlement. The potential for seismic-induced settlement reported in the preliminary geotechnical investigation report supersedes the last sentence in paragraph 5 of Section 5.3.1.1.11 of the Application for Certification. The potential for seismic-induced settlement was analyzed using the LIQUEFY program. Based on the results of the analyses, some seismic-induced settlement could occur within the loose to medium dense sandy and silty layers within 40 feet of the ground surface based on a Design Level Earthquake (DLE) event, resulting in settlement of about 2 inches within the susceptible soil layers.

Constructing settlement-sensitive structures on driven piles will mitigate potential seismic-induced settlement impacts on the operation of the facilities. Geotechnical recommendations for driven piles are provided in Appendix L of the Application for Certification (see Section 7.9).

TECHNICAL AREA: GEOLOGICAL HAZARDS AND RESOURCES

Data Request 37 Rev: Please address the potential for site soils, in particular silts, to collapse when subjected to water, and how the impact will be mitigated.

Response:

Hydrocompaction is the process of volume decrease and density increase that occurs when moisture-deficient deposits compact as they are wetted for the first time since burial. The PEC Site is located close to or within areas of historic hydrocompaction or near-surface subsidence.

The PEC Site has been irrigated for agricultural use for many years, which lessens the likelihood of near-surface subsidence following construction of the PEC. Constructing settlement-sensitive structures on driven piles will mitigate potential hydrocompaction impacts on the operation of the facilities. Geotechnical recommendations for driven piles are provided in Appendix L of the Application for Certification (see Section 7.9).

TECHNICAL AREA: GEOLOGICAL HAZARDS AND RESOURCES

Data Request 38 Rev: Please clarify this discrepancy, what impact expansive soils may have on the operation of the proposed facilities, and how such impacts will be mitigated.

Response:

Discrepancies between the Geological Hazards and Resources section and the preliminary geotechnical investigation report included as Appendix L of the Application for Certification occurred because the section was completed before the appendix. Geotechnical investigation identified the presence of some moderately expansive fine-grained soils underlying the PEC Site. The potential for moderately expansive soils reported in the preliminary geotechnical investigation report supersedes the last sentence in paragraph 1 of Section 5.3.1.1.12 of the Application for Certification.

Recommendations in Appendix L for foundation considerations, earthwork, pavements, and sidewalks include mitigation measures for potential moderately expansive soil impacts. Constructing settlement-sensitive structures on driven piles will mitigate potential moderately expansive soil impacts on the operation of the facilities. Geotechnical recommendations for driven piles are provided in Appendix L of the Application for Certification (see Section 7.9). The expansion potential of the compacted soils below non-settlement sensitive structures will be mitigated by mixing moderately expansive soils with non-expansive soils and compacting the mixed soils on the wet side of optimum moisture content. Geotechnical recommendations for engineered fill and spread footings for lightly loaded structures are provided in Appendix L of the Application for Certification (see Sections 7.2.2 and 7.7).

TECHNICAL AREA: LAND USE

Data Request 39 Rev: For staff to complete evaluation of the proposed cancellation, please submit a schedule as to when Fresno County will process the cancellation application and when the Board of Supervisors will hear the cancellation application.

Response:

Williamson Act Cancellation Process Schedule

The Fresno County process and anticipated timetable for the Williamson Act cancellation of the 12.8 acres is as follows:

1. Petition for Cancellation - Filed by the Landowner on November 3, 2006
2. Determination of Completeness - November 2006
3. DOC Review and Comment – January 18, 2007
4. Memo to Assessor's Office requesting Fee amount – November 2007
5. County "sign-off" on CEQA analysis - January 2007
6. Cancellation comes before Agricultural Land Conservation Committee for recommendation to Board of Supervisors - (meets 1st Wednesday of Month; needs 30 days after CEQA/Assess. Office steps) - TBD
7. Board of Supervisors acts on ALCC recommendation (meets on the following Tuesdays: 3-13, 3-27, 4-17, 4-24, 5-1, 5-15, 5-22) - TBD

TECHNICAL AREA: LAND USE

Data Request 40 Rev: To conform to the requirements of Section 66412.2 of the Subdivision Map Act, please provide a plot plan that demonstrates the project's conformance with Section 816.5 (Property Development Standards) of the Fresno County Zoning Ordinance.

Response:

PEC will submit a *Site Plan Review* to Fresno County Department of Public Works and Planning - Development Services Division in lieu of proceeding with County provisions pursuant to the Subdivision Map Act, Section 66412.2. The *Site Plan Review* will be submitted by January 27, 2007. A final review by the County is expected by March 23, 2007.

This submittal consists of the following:

Cover letter
Site Plan
Operational Statement
Grading and Drainage Plan
Check for submittal Fee

The principal contact at the Department of Public Works and Planning, Development Services Division is:

Mr. Robin Tani
(559) 262-4215
(800) 742-1011, ext. 24215
rtani@co.fresno.ca.us

TECHNICAL AREA: NOISE

Data Request 41 Rev: Please provide the mitigation measures being considered and the final estimated project noise levels during operations at locations ML1 and ML2 after incorporating the effects of the additional noise mitigation measures into the noise calculations. As an alternative for ML2, state if, in fact, the use of this location as a multi-family residence will be removed prior to the start of project operation.

Response:

Panoche Energy Center has entered discussions with Farmer's International, the owner of the property ML2, to relocate the residence approximately 0.5 miles away so that it is unaffected by the power plant.

ML-1 consists of a five-unit, one-story residential complex. The Applicant is evaluating abatement designs that would limit noise levels at ML-1 to meet the 45 dbA nighttime County standard. Meanwhile, it should be noted that Starwood Power – Midway, LLC (Starwood) filed an AFC with this Commission on November 17, 2006 (AFC 06-AFC-10). The proposed Starwood project will be located approximately 460 feet from ML-1 (Starwood AFC, Section 5.12.5.1). The Starwood AFC, in section 5.12.5.1, points out "A signed agreement is in place between the landowner of the 5-plex at ML-1 and Starwood-Power Midway, LLC to relocate the current residences."

If Starwood implements its agreement with the landowner to relocate the residents at ML-1, then PEC will not have to implement its abatement design. Conversely, if Starwood does not implement its agreement, PEC will be able to demonstrate compliance with the 45 dBa Fresno County nighttime standard..

TECHNICAL AREA: SOCIOECONOMICS

Data Request 42 Rev: Please indicate the year for all economic estimates (e.g., school impact fees, construction and operation sales tax).

Response:

The economic estimates provided in Section 5.10 Socioeconomics, of the PEC Application for Certification appear in 2005 U.S. dollars.

TECHNICAL AREA: SOCIOECONOMICS

Data Request 43 Rev: Please provide an estimate of the percentage of the construction workforce that would be local, from Fresno County, and non-local.

Response:

Based on current projected labor and employment data from the California Employment Development Department, 2006, and Building and Construction Trades Council of Fresno, Madera, Tulare, and Kings County, 2006, the PEC project expects that construction labor requirements will be met with workers from Fresno, Madera, Tulare, and Kings Counties.

TECHNICAL AREA: SOCIOECONOMICS

Data Request 44 Rev: Please provide an estimate of the amount of sales tax paid by the owners of the project during construction and operation.

Response:

The estimated value of materials and supplies that would be purchased within Fresno County during the construction phase is between $1 to 2 million, which would provide an average of $119,620 (2005 U.S. dollars) in sales tax. Annual sales tax from plant operation, based on estimated local materials and supplies purchases of $970,000, is expected to be $77,358 per year, in 2005 U.S. dollars. The table below summarizes the estimated construction and operation sales tax for Fresno County.

Estimated Construction and Operation Sales Tax
For Fresno County

Recipient	Percentage Sales Tax Allocation[1]	PEC Construction Estimated Sales Tax[2] (2005 U.S. dollars)	PEC Operation Estimated Sales Tax (2005 U.S. dollars)
State	6.0	90,000	58,200
Combined State and Local (Fresno County)	1.0	15,000	9,700
Fresno County	0.25	3,750	2,425
District Tax[3]	0.725	10,875	7,033
Total Sales Tax	7.975	119,620	77,358

[1] As per California Board of Equalization, 2006.
[2] Sales tax is based on the average ($1.5 million) of the estimated value of materials and supplies purchased within Fresno County during the construction phase (between $1-2 million).
[3] With exception to the district tax in the City of Clovis (1.025%), all other district taxes in Fresno County are 0.725%.

TECHNICAL AREA: SOILS AND WATER RESOURCES

Data Request 45 Rev: Please provide the results of laboratory analyses of groundwater, including TDS, for each of the three aquifers.

Response:

Results of laboratory analyses for groundwater samples recovered from three depths underlying the PEC site are included in the attached Report of Monitoring Well Installation (Appendix A). Total dissolved solids concentrations were 1,100, 840, and 2,900 milligrams per liter in groundwater samples collected from the lower portion of the confined aquifer, the upper portion of the confined aquifer, and the semi-confined aquifer, respectively.

TECHNICAL AREA: SOILS AND WATER RESOURCES

Data Request 46 Rev: Please provide the above mentioned cross-sections in standard engineering drawings of no smaller than 11 x 17 inches.

Response:

Standard engineering drawings drafted as 11 x 17 inch figures are provided as Figures 1A and 1B through Figure 3. Figures 1A and 1B show the locations of the lines of cross section. Figures 2 and 3 show Geologic Cross Section A-A' and Geologic Cross Section B-B', respectively.

Insert DR # 46 Figure 1a

Insert DR # 46 Figure 1b

Insert DR # 46 Figure 2

Insert DR # 46 Figure 3

TECHNICAL AREA: SOILS AND WATER RESOURCES

Data Request 47 Rev: Please provide aquifer data for the groundwater production wells proposed for the project, and the effect(s) that these wells will have on the upper aquifer, as well as each of the confined aquifers. The vertical gradient for each aquifer should be presented as part of this analysis.

Response:

Several aquifer parameters including depth to groundwater, and lithologic samples were collected during the drilling and installation of the three monitoring wells. Depth to groundwater and screened intervals were then used to calculate the vertical gradients below the site. Since these wells were completed as monitoring wells, no aquifer tests were performed. There are a few existing production wells that are similar in size as the proposed PEC producing well and several attempts were made to collect additional aquifer data from these wells, but the attempts were unsuccessful. Therefore, initial estimates of hydraulic conductivity were obtained from the US Geologic Survey (USGS). The USGS estimates of hydraulic conductivity for the Central Valley were developed from aquifer test data, specific capacity data from area wells.

To estimate the effects the future pumping of the proposed groundwater production well might have on Upper Tulare Aquifer, the Corcoran Aquitard, the Lower Tulare Aquifer, both local and regional flow regime and on surrounding wells, a 3-D groundwater model was constructed. Both the vertical gradient data (collected from the recent monitoring well installation) and hydraulic conductivity data (from published references) were used in the construction of the 3-D groundwater model. The specific details [including input parameters (vertical gradients, groundwater elevation data, hydraulic conductivity information), assumptions and limitation] of the 3-D model can be found in the attached URS Technical Memorandum (Appendix B). In summary, four groundwater-pumping scenarios (Scenario 1, no pumping; Scenario 2, pumping at 750 gpm; Scenario 3, pumping at 1000 gpm; Scenario 4, pumping at 2000 gpm) were incorporated into the model. Based on the predicted groundwater demand of the proposed facility, the proposed PEC well will be pumped at an average of 750 gpm. The Model run (Scenario 2) predict that if the well is pumped at 750 gpm, there will be no impacts (no drawdown) will occur in either of the aquifers. Even when the well is pumped at 1000 gpm (33% more than the proposed pumping rate) no noticeable drawdown occurs. Limited drawdown (less than 2.5 feet) occurs when the well is pumped at 2000 gpm.

TECHNICAL AREA: SOILS AND WATER RESOURCES

Data Request 48 Rev: Please evaluate slug testing as a means of obtaining site specific aquifer data. Slug test data would provide a better estimate of site specific aquifer parameters than those obtained from regional data sources that were used.

Response:

Estimation of aquifer parameters using slug test data from monitoring wells MW-1, MW-2, and MW-3 is feasible. However, slug tests only stress the aquifer in a relatively small zone of influence immediately surrounding the screened interval of the well. The method will produce hydraulic conductivity estimates that are not necessarily representative of the hydraulic conductivity of the aquifer at a larger scale. In addition, the high permeability of the aquifers will yield almost immediate recovery from negligible stresses placed on the aquifer by inserting slugs in a small diameter well, which will likely result in meaningless data for slug test analysis. It is important to match the scale of the aquifer test with the scale of the area of interest. Aquifer test data generated using small diameter monitoring wells with 20-foot long screened intervals will not be directly applicable to production wells with screened intervals that are hundreds of feet long.

Subbasin-specific estimates of hydrogeologic parameters such as specific yield and hydraulic conductivity cited in detailed regional studies and groundwater modeling efforts are inevitably more reliable than site-specific data from the on-site monitoring wells when predicting the performance of production wells at the site. However, if the collection of site-specific data fulfills a regulatory obligation, then it may be more appropriate to consider the application of more significant stresses on the aquifer, such as water injection or pumping and recovery. Although the test results may not be representative of the entire aquifer conditions, the resulting test data would be more precise than what might be collected from slug tests.

TECHNICAL AREA: SOILS AND WATER RESOURCES

Data Request 49 Rev: Please provide an update on the EPA review of the permit application. Include technical comments from EPA as well as an updated schedule and timeline for permit approval.

Response:

The status of the permit application is that it is Administratively Complete and it is in the Technical Review phase (copy of letter from EPA on the following page).

Per our December 21, 2006 correspondence with U.S. EPA (copy of e-mail message is provided on the following pages), updates and progress reports are not necessary from EPA. All written correspondence to and from both EPA and Panoche Energy Center is required to be provided to the primary contacts of the Energy Commission, the Regional Board, and the Division of Oil, Gas, and Geothermal Resources.

The PEC will provide CEC with copies of any future correspondence received from EPA.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION IX
75 Hawthorne Street
San Francisco, CA 94105-3901

October 20, 2006

Gary Chandler
President
Panoche Energy Center, LLC
2542 Singletree Lane
South Jordan, Utah 84095

RE: Administrative Review

Dear Mr. Chandler,

We reviewed your permit application for 4 Class 1Nonhazardous wells which was sent on September 14, 2006. The application is Administratively Complete. We have begun the Technical Review process which was outlined in a meeting at our office on September 28, 2006.

If you have any questions or need to discuss this further, please do not hesitate to call Mr. George Robin, of my staff at 415-972-3532 or me at 415-972-3971.

Sincerely,

Elizabeth Jones for

David Albright, Manager
Ground Water Office

cc: Doug Patteson, Ca. Central Valley Regional Water Quality Control Board
Glenn Muggleberg, Ca. Division of Oil, Gas, and Geothermal Resources, District 5
Michael Stephens, Ca. Energy Commission

Printed on Recycled Paper

-----Robin.George@epamail.epa.gov wrote: -----

To: Maggie_Fitzgerald@URSCorp.com George Robin/R9/USEPA/US@EPA
From: George Robin/R9/USEPA/US@EPA
Date: 12/21/2006 08:35AM
cc: Jreede@energy.state.ca.us, Albright.David@epamail.epa.gov
Subject: Re: Updates - Panoche Energy Center

Hello Maggie,

The status of the permit application is that it is Administratively complete and it is in the Technical Review phase. Timelines, schedules will not be specifically available however we understand your need for expedient review and processing and are likewise working on this project.

Updates and progress reports are not necessary from EPA in that copies of all written correspondence to and from both EPA and Panoche Energy Center is required to be provided to the primary contacts of the Energy Commission, the Regional Board and the Division of Oil, Gas, and Geothermal Resources.

If you need to discuss this further, please reply to this e-mail or call me at (415) 972-3532.

George Robin
Engineer
Ground Water Office, WTR-9
Underground Injection Control program

-----Maggie_Fitzgerald@URSCorp.com wrote: -----

To: George Robin/R9/USEPA/US@EPA
From: Maggie_Fitzgerald@URSCorp.com
Date: 12/20/2006 10:54AM
cc: Jreede@energy.state.ca.us
Subject: Panoche Energy Center

Good morning George.

We have not met yet but I am the new URS Program Manager for the Panoche Energy Center project. I am writing to inquire about the status of the UIC permit application submitted in September 2006.

On December 8, 2006 we received formal data requests from the CEC for the PEC project. One of the data requests, data request #49, refers to the status of the UIC permit application process. Data Request #49 is as follows:

"Please provide an update on the EPA review of the permit application. Include technical comments from EPA as well as an updated schedule and timeline for permit approval."

I am aware that you have been contacted recently by the Applicant so I apologize for yet another request. If you are able to provide any update on the schedule, timeline, any potential data requests, etc., it would be greatly appreciated. Our Data Request responses are due to

CEC on January 9, 2007 and we are in the process of compiling all of the responses.

I look forward to meeting you soon and hope that you have a great holiday(s). Thank you.

Maggie Fitzgerald
URS Corporation
2020 East First Street, Suite 400
Santa Ana, CA 92705
714-648-2759 direct
maggie_fitzgerald@urscorp.com

TECHNICAL AREA: SOILS AND WATER RESOURCES

Data Request 50 Rev: In the event that data from the exploratory boring does not support underground injection as a means of waste-water disposal, please discuss alternative means of disposal.

Response:

Development and use of deep injection wells has been singularly proposed for disposal of wastewater from the PEC. However, in the unlikely event that deep injection wells cannot be utilized due to scheduling or technical considerations, use of alternative technologies for disposal of wastewater from the PEC will be evaluated. Evaluation of alternative technologies and resources would include feasibility, environmental and engineering studies as well as detailed cost estimates. Such studies would need to be completed to determine if the Project could sustain the associated economic and operational impacts. These studies are not normally undertaken or justified for alternatives that are not likely to be implemented. The studies would be initiated in late spring of 2007 if there are indications of significant problems with the permitting or technical viability of the deep injection wells.

Analysis of wastewater disposal alternatives showed injection wells to be a superior technology based on economics and operational characteristics. Evaluation of geologic information from the project area provides strong evidence that development of deep injection wells for wastewater disposal at the PEC is technically feasible. Two 100% redundant wells are initially proposed for installation. To ensure that adequate redundancy and capacity will be available, the applicant has applied for authorization to construct four deep injection wells at the PEC. Based on the applicant's discussions with permitting staff at USEPA Region IX, it is expected that the permit for construction of the deep injection wells will be received between June and September of 2007. The applicant has begun its request for proposals to potential contractors for the development and installation of the deep injection well(s) in the fall of 2007.

TECHNICAL AREA: TRANSMISSION SYSTEM ENGINEERING

Data Request 51 Rev: Please provide the final System Impact Study. The Study should analyze the system impact with and without the project during peak and off-peak system conditions, which will demonstrate conformance or non-conformance with the utility reliability and planning criteria with the following provisions:

a. Identify major assumptions in the base cases including imports to the system, major generation and load changes in the system and queue generation.

b. Analyze system for N-0, important N-1 and critical N-2 contingency conditions and provide a list of criteria violations in a table showing the loadings before and after adding the new generation and all short circuit studies.

c. Analyze system for Transient Stability and Post-transient voltage conditions under critical N-1 and N-2 contingencies, and provide related plots, switching data and a list for voltage violations in the studies.

d. Provide a list of contingencies evaluated for each study.

e. List mitigation measures considered and those selected for all criteria violations.

f. Provide electronic copies of *.sav and *.drw PSLF files.

g. Provide power flow diagrams (MW, % loading & per unit voltage) for base cases with and without the project. Power flow diagrams must also be provided for all N-0, N-1 and N-2 studies where overloads or voltage violations appear.

h. Provide environmental information related to any mitigation identified in the studies.

Response:

Per Dr. James W. Reede's (Energy Facility Siting Project Manager of the California Energy Commission) request, 7 hard copies and 5 CDs have been sent out on December 21, 2006 via FedEx Overnight and delivered on December 22, 2006.

Responses to items b. and f. will be provided upon agreement of confidentiality with PG&E.

TECHNICAL AREA: VISUAL RESOURCES - PLUME

Data Request 52 Rev: Please summarize for the cooling tower the conditions that affect vapor plume formation including number of cells in operation, cooling tower exhaust temperature, and exhaust mass flow rate. Please provide values to complete the table, and additional data as necessary for staff to be able to determine how the heat rejection load varies with ambient conditions and also determine at what ambient conditions cooling tower cells may be shut down.

Parameter	Cooling Tower Exhausts		
Number of Cells	5 cells		
Cell Height*	12.8 meters (42 feet)		
Cell Diameter*	6.71 meters (22 feet)		
Tower Housing Length*	15.24 meters (151 feet)		
Tower Housing Width*	12.8 meters (42 feet)		
Ambient Temperature*	16.8°F	63.3°F	114°F
Ambient Relative Humidity	95.2%	76%	14.4%
Number of Cells in Operation			
Heat Rejection (MW/hr)	90.5	117.5	127.8
Exhaust Temperature (°F)			
Exhaust Flow Rate (lb/hr)			

*Ambient conditions and heat rejection, neglecting water makeup and blowdown, are based on the three heat balance cases provided in Appendix A of the AFC. Cell diameter and height are from the air quality modeling CD. Tower length and width are from AFC Table 3.4-1.

Response:

Parameter	Cooling Tower Exhausts		
Number of Cells	5 cells		
Cell Height*	12.8 meters (42 feet)		
Cell Diameter*	6.71 meters (22 feet)		
Tower Housing Length*	15.24 meters (151 feet)		
Tower Housing Width*	12.8 meters (42 feet)		
Ambient Temperature*	16.8°F	63.3°F	114°F
Ambient Relative Humidity	84.0%	62.0%	14.6%
Number of Cells in Operation	2	4	4
Heat Rejection (MMBtu/hr)	313	392	441
Exhaust Temperature (°F)	82	90	103
Exhaust Flow Rate (lb/hr)	8,100,000	13,300,000	12,800,000

The cooling tower performance data is provided in the table above. Four (4) cells are expected to be in operation at ambient temperatures above 50ºF; three cells from 30ºF to 50ºF; and two cells

for temperatures below 30ºF. The heat rejection can be defined as a function of ambient temperature in two regions: below 60ºF and 60ºF and higher. This is because evaporative coolers are used for CTG inlet air cooling at ambient temperatures 60ºF and higher. The expected heat rejection is given as follows:

Below 60ºF	-	HR = 70.3 + 0.48*Tamb (MMBtu/hr for each CT in service)
60ºF and above	-	HR = 82.8 + 0.24*Tamb (MMBtu/hr for each CT in service)

TECHNICAL AREA: VISUAL RESOURCES - PLUME

Data Request 53 Rev: Additional combinations of temperature and relative humidity or curves showing heat rejection vs. ambient condition, if provided by the applicant, will be used to more accurately represent the cooling tower exhaust conditions. Please include appropriate design margins for the number of cells in operation, exhaust flow rate and exhaust temperature in consideration that the air flow per heat rejection ratio is often used as a Condition of Certification design limit.

Response:

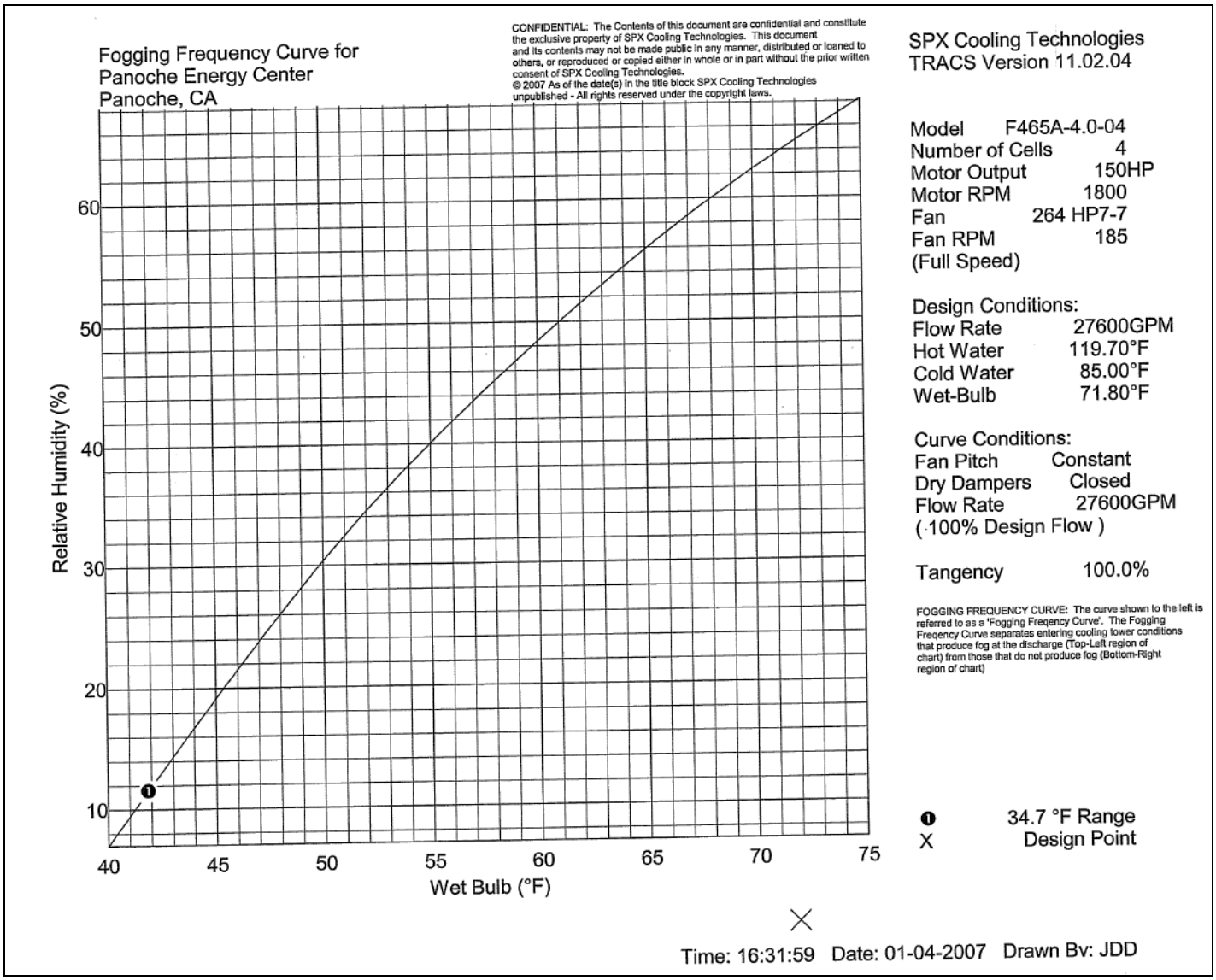
The requested information is provided in the response to item 52, above.

TECHNICAL AREA: VISUAL RESOURCES - PLUME

Data Request 54 Rev: Please provide the cooling tower manufacturer and model number information and a fogging frequency curve from the cooling tower vendor, if available.

Response:

The specific cooling tower for the project has not yet been selected. However, it will be a fiberglass, counter-flow, mechanical-draft cooling tower such as a Marley Model F465A-4.0-4. A fogging frequency curve created by Marley for this tower model is provided below.



TECHNICAL AREA: VISUAL RESOURCES - PLUME

Data Request 55 Rev: Please confirm that under normal full load operation of the four turbines only four of the five cooling tower cells will be operating, as noted in Table 3.11.1 of the AFC. Also, please indicate under what ambient conditions that additional cooling tower cells may be shut down while still operating under full load for all four turbines.

Response:

The tower is designed for four-cell operation, with the fifth cell as a spare for reliability purposes. Four cells or less will be used under normal four-unit operation. The conditions for cell shut down are addressed in response for Data Request 52, above.

TECHNICAL AREA: VISUAL RESOURCES - PLUME

Data Request 56 Rev: Please confirm that the cooling tower fan motors will not have variable speed/flow controllers.

Response:

The cooling tower fan motors will not be of the variable speed type.

TECHNICAL AREA: VISUAL RESOURCES - PLUME

Data Request 57 Rev: Please provide representative raw and formatted meteorological data for visible plume modeling, if desired. This meteorological data set must be reasonably determined to be from a more project representative site than Lemoore NAS and include at least 5 years of 95 percent or better complete data. Additionally, this data set must have all of the normal ISCST3 meteorological data parameters, plus the following formatted parameters: relative humidity, present weather, visibility, cloud cover, and ceiling height. As appropriate, the units (such as knots for wind speed) for each of the parameters must also be provided.

Response:

PEC is not aware of any more complete or more representative meteorological data set to support CEC's visible plume modeling than the Lemoore NAS data referenced in the data request.

TECHNICAL AREA: VISUAL RESOURCES - PLUME

Data Request 58 Rev: Please indicate by quarter, or by day or day of week if desired, the hours of the day that the project would be expected to operate given the maximum quarterly operating schedule of 1,100 hours in the first and second quarters, 1,200 hours in the fourth quarter, and 1,600 hours in the third quarter (AFC page 5.2-36).

Response:

The units will be dispatched by PG&E based on an economic dispatch model. PEC is contractually obligated to be able to operate up to the stated number of hours per calendar quarter. The GE LMS100 machines are very efficient units designed to meet peaking and intermediate load requirements. Although PG&E can dispatch these units whenever needed, PEC believes these units will likely be dispatched during weekday peak hours and other times when demand is great. However, PEC is unable to predict any details beyond the quarterly hour limits in the PG&E contract.

TECHNICAL AREA: VISUAL RESOURCES - PLUME

Data Request 59 Rev: Please indicate any other reasonable worst-case hourly operating profiles for this project that are supported by PG&E data on expected maximum future load demand for the life of the facility. Please provide all supporting PG&E reference materials for the referenced maximum hourly operating profiles.

Response:

The units will be dispatched by PG&E based on an economic dispatch model. PEC is contractually obligated to be able to operate up to the stated number of hours per calendar quarter. Any load predictions beyond the quarterly hour limits in the PG&E contract are not available to PEC.

TECHNICAL AREA: WASTE MANAGEMENT

Data Request 60 Rev: Using the Interim Guidance for Sampling Agricultural Fields for School Sites (Second Revision, dated August 26, 2002) sponsored by the California Department of Toxic Substances Control, California Environmental Protection Agency, please identify agricultural chemicals used on the site and chemicals or metals of potential concern. The project owner should also sample for concentrations of arsenic and selenium in addition to the other chemicals. A minimum of eight composite samples should also be taken on half-acre centers. Although the guidance is listed as an "Interim Guidance...for School Sites," DTSC uses the guidance for all types of commercial and industrial businesses constructed on agricultural properties. The guidance is intended to assist environmental assessors in designing initial investigation for sites with historical agricultural uses.

Response:

Soil samples were collected to confirm the presence of agricultural chemicals, concentrations of arsenic and selenium, as well as other chemicals and metals of potential concern. The results of this soil sampling event are presented in the attached technical memorandum (Appendix C)